June 8 — June 14, 2015 | bloomberg.com

Bloomberg Businessweek

Rx for saving a life:

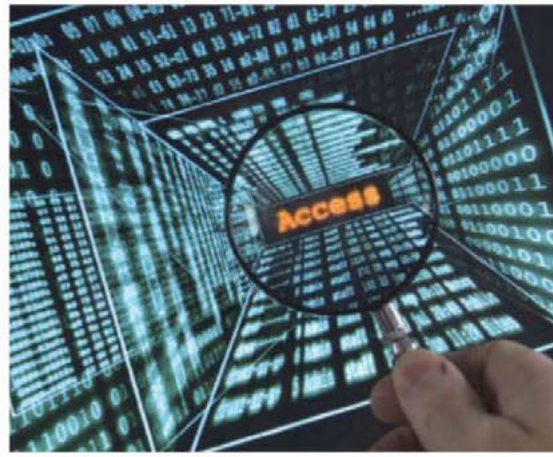
1 pill/day x 12 weeks = $94,500

How Much Should a Miracle Cost? p60

Interconnected Cyber Risks

What's Your Cyber Breach Price Tag?

The average data breach costs $3.79 million. But your business doesn't have to be average at protecting against cyber risks



With cyber breach costs more than doubling for some industries in two years, every sector needs to protect itself.

Over the past two years, the cost to a business of each lost or stolen record resulting from a cyber breach has gone up in most sectors, in some cases dramatically so. A just-released global analysis of data breaches from the Ponemon Institute shows that for large companies around the globe the average cost of a data breach is $3.79 million.

The data shows that while the costs vary by industry, they are not limited to any particular sector. The sectors with the largest increases from two years ago are education (now at $300 per lost or stolen record, up 170 percent), retail ($165, up 112 percent), healthcare ($363, up 55 percent), industrial ($155, up 50 percent) and media ($126, up 22 percent).

"When we're asked about the industries that tend to be most at risk from cyber attacks, the top three are always financial institutions, retail and healthcare," says Lori Bailey, Global Head of Special Lines, Zurich Insurance Group (Zurich). "Breaches in those sectors get the headlines, but when you're assessing the potential severity of follow-on effects you need to incorporate any industry that is heavily reliant on technology, logistics or computers. That can be manufacturing, energy and utilities, airlines—all depend on interconnected networks and suppliers talking to one another. In fact, over 50 percent of supplier disruptions were caused by cyber issues last year, according to a Zurich-sponsored study by the Business Continuity Institute."

Focusing on "what" to protect

Business sectors differ in terms of customers, employees and the amount of data and automated processes that are moving through the company. That means that sectors have differing cyber risk exposures and specific needs to manage those risks. Linda Conrad, Head of Strategic Business Risk, Global Corporate in North America, Zurich, says, "Organizations should undertake a business impact analysis to determine what their business needs to protect, take steps to protect critical functions and data, and then put a robust backup plan and insurance in place."

The main difference from one industry to another is understanding what's important to protect. "In retail, you have people's credit card numbers, and it's extremely important to protect that data," says Conrad. "However, if you take manufacturing, for example, there aren't thousands of credit card transactions, but they may have automated systems in their assembly line, supply procurement or logistics. Sales ordering and even payroll are also frequently automated. In these cases, it's not data that needs to be safeguarded; it's actually the processes themselves. So an important first step for any information security organization is to define and prioritize what they're protecting for the enterprise."

Businesses' exposure to cyber risks will likely continue to increase rapidly as the world and they become ever more interconnected. Faced with this growing complexity, companies need to ensure that cyber risks are not dealt with in isolation, but rather addressed as part of a truly holistic risk management strategy. That says Bailey, requires "many different stakeholders to be involved, to make sure that every aspect of the organization is working in tandem to assess and monitor the exposures that the company might have. One glitch in the process can really have a domino effect.

"That's the real challenge risk managers face today: trying to understand how cyber fits into the larger picture of risk connectivity, playing out various scenarios and then increasing resiliency from a holistic standpoint." —*Mike Olson*

"The main difference from one industry to another is understanding what's important to protect. If you take manufacturing, for example, there aren't thousands of credit card transactions, but they may have automated systems in their assembly line."

Neil Chapman, President of ExxonMobil Chemical Company

Petrochemicals and the Future of Energy

A burgeoning middle class in the developing world bodes well for leading chemical producers

There are approximately 7 billion people in the world today, and estimates predict the global population will reach 9 billion by 2040. As the thirst for products made from chemicals grows—chemical demand is expected to increase by 50 percent in the next decade alone—the best-prepared companies in the sector find themselves in a prime position to mold the future of energy.

"The connection between growth in population and growth of GDP, or wealth per capita, is well documented," explains Neil Chapman, President of ExxonMobil Chemical Company. The effects of this growth are tangible, as rapid economic expansion in developing regions means growth of the middle class. When a certain level of disposable income is reached in a household, a family's focus turns to convenience—which is good for the petrochemical business. Daily trips to the market are replaced with weekly trips to the grocery store, where most foods are packaged, not simply to look nice on the shelves, but, more importantly, to extend the shelf life of the food.

Such packaging is made from polyethylene, a primary product of the chemical industry, but the convenience story extends well beyond supermarket aisles. As income levels rise throughout the world, so does the sale of appliances, such as washing machines and dryers, with parts made from plastic and synthetic rubber.

Likewise, an increase in take-home pay results in the increased use of private cars. And a car, ExxonMobil's Chapman notes, is full of petrochemicals. "Think of the tires, the bumpers, the seals around the windows, the hoses under the hood," he explains. "Those are all elastomers, synthetic rubbers and plastic."

Chapman worked in China at the turn of the millennium, when the country's publicly stated annual growth rates were in the 10 percent range. Today that figure is closer to 7 percent—which, based on the size of the current Chinese economy, makes actual annual growth even larger today. Chapman notes growth is also taking place elsewhere in the developing world, be it in India, South America, Africa and Asia.

"In aggregate, that growth in emerging economies is much higher than it is in the Western world," says Chapman, who also notes that these countries are more prepared to innovate faster with new products, equipment and ideas than the more mature OECD countries.

The drive in demand in emerging economies for petrochemicals due to population and GDP growth is only half the story; there is also a sustainability component. For example, drivers want a car that uses less gasoline, which in part entails making the vehicle lighter. Typically, that means using less metal and more plastics such as polypropylene, as well as components like advanced synthetic rubber lining inside the tires to sustain the right pressure longer and yield more fuel efficiency.

The same holds true back at the grocery store. Using new catalysts and other innovations, ExxonMobil Chemical produces stronger polyethylene that has made the packaging film that extends the shelf life of foods dramatically thinner, without any reduction in the performance of the plastic. Buoyed by record-high domestic shale gas production for feedstock and energy, ExxonMobil Chemical will open new petrochemical facilities in 2017 in Baytown, Texas to supply growing demand in the developing world.

Continuing to convey the message of chemicals' sustainability benefits is a key focus for the world's largest publicly traded oil and gas company, and the effects should be felt throughout the industry as a whole. "You've got this combination of middle-class growth and this great sustainability story, which every population in the world is looking for," Chapman says. "It's the convergence of the two that underpins our confidence in the growth of chemicals for multiple decades."

— *Evan Rothman*

Thin packaging film made from polyethylene produced by ExxonMobil Chemical greatly extends the shelf life of food.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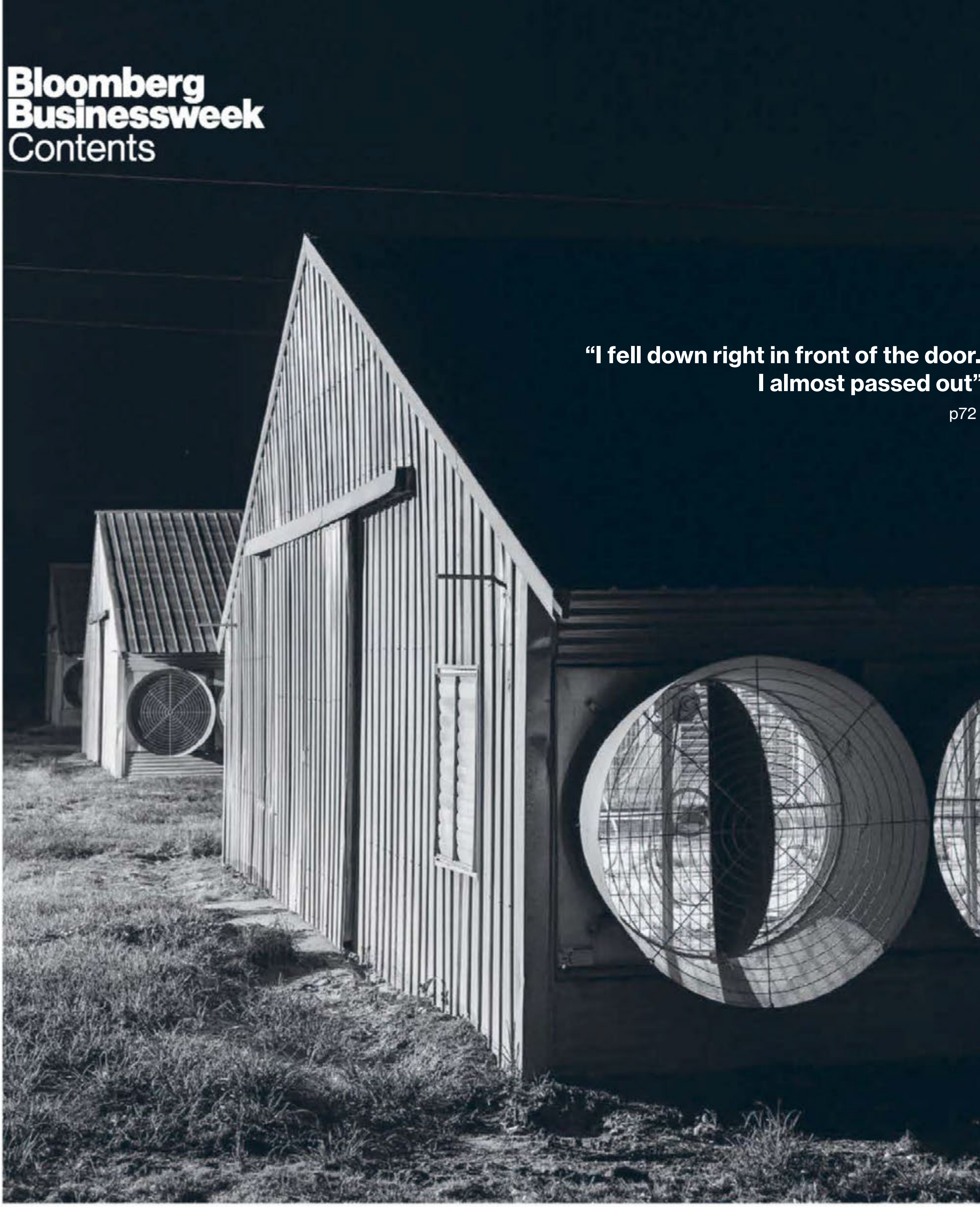

"I fell down right in front of the door. I almost passed out"

PHOTOGRAPH BY WILLIAM MEBANE FOR BLOOMBERG BUSINESSWEEK

"This is madness. It is like telling someone with breast cancer you have to wait until Stage 3 cancer before you can get treatment"

"Data scientists are the new superheroes"

"People's eyes glaze over and they say just one word: Obamacare. After that, you may as well be talking to a pig about Christmas"

Bloomberg Businessweek

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Cover Trail

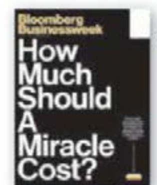
How the cover gets made

1 "Cover story is about a new drug that can cure hepatitis C."

"That's great!"

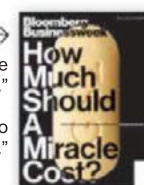
"A prescription can cost up to $94,500."

"I knew there was something terrible coming. We should probably play this straight, with big type."



2 "Big headline with small pill."

"Too simple."



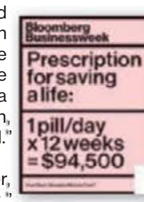
3 "Big headline with big pill."

"Too confusing."

4 "Lots of medium-size words with a small pill."

"That's a lot of words to fill."

5 "Smaller than big and bigger than medium-size words in the form of a prescription, with no pill."



"This is better, but no pink."

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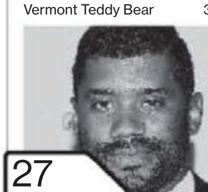

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SIEMENS

Turning Big Data into Smart Data

In today's interconnected world, it's not enough to capture information. You need to understand it

Big Data is already here. One zettabyte—that's a 1 with 21 zeros at the end—is 50 percent more than all the grains of sand on all of the beaches on Earth. By the year 2020, the volume of digital data stored is expected to reach 40 zettabytes, a 50-fold increase in the span of a decade that means the information collected for each man, woman and child will be the equivalent of the text contained in three million books.

Collecting that data is one thing, but understanding it—and using the resulting knowledge to optimize existing systems—is another. "What you really need are ways to structure big data more efficiently," explains Eric Spiegel, President and CEO of Siemens USA. "What are the processes you can put in place to capture that data, analyze it and produce usable reports so that businesses can understand what they need to do differently? That's the transition."

Welcome to the world of Smart Data. Take a wind turbine, for instance. In the era of smart data, Siemens sensors not only measure the mechanical vibrations inside, but instantly compare them against a database containing the measurement values of 6,000 other turbines. Armed with that information, a service team can take immediate action once an anomaly is spotted, and carry out anticipatory maintenance before the system breaks down. This predictive capability is now being applied to smarter service and maintenance for trains, the electrical grid and gas turbine engines.

In the case of a gas or wind turbine, or even a drive unit in the coolant pump at a power station, leveraging smart data could keep the lights on for thousands of residents. For trains, this could mean enhanced reliability for commuters. And at research hospitals that use Siemens CT scanners, optimizing machines and the departments that use them can save lives.

Turning massive, unstructured data volumes into smart data takes a unique blend of industry, device and analytics expertise. On the industry and device fronts, 168-year-old Siemens continues to grow its in-depth knowledge of the physical world by actually building equipment—no surprise from the company that literally invented the electric locomotive.

"It's not enough to be an IT company; you need to be a technology company that has a deep domain knowledge," explains Spiegel, who notes that the marriage of IT and industrial engineering means that nearly every device Siemens makes, from turbines to transmission lines, now has sensors and software inside. "Because we make those devices, we know how they should operate. That way, when you get this big data, you understand how it can be used to make things run more effectively."

Enter analytics, where Siemens boasts more than 280,000 pieces of equipment worldwide that are each connected to maintenance centers located on several continents. Together, these centers process and analyze more than 10 terabytes of data every month—an amount expected to increase tenfold by 2020—from industrial automation, power generation and countless other systems to extract value from it.

Turning multi-sourced big data into smart data that is action-oriented and predictive promises to create a significant competitive advantage for those forward-thinking businesses ready to adopt it. From the startup that is working with limited resources to the large corporation aiming to grow its market share, more and more companies are turning to smart data to identify what makes current operations suboptimal, and to develop solutions that lead to more efficient use of time and resources. In fact, some plants have already improved capacity 30 percent by utilizing smart data.

"Customers don't just want to buy a piece of equipment and a service contract," Spiegel adds. "What they really want to know is how we are going to use these technologies to help them optimize their business." With 60 global business units dedicated to doing just that, it's no wonder that Siemens is perfectly positioned to thrive in the digital world—no matter how many zettabytes it holds. ●

At Siemens, we're committed to making wind energy an increasingly important part of America's energy story. We use innovative design and advanced technologies to make wind power more efficient and cost-effective than ever before.

For instance, our unique blade design allows our turbines to capture more wind and produce more electricity. It's innovations like these that are making wind energy a vital part of the U.S. energy mix.

Today, more than 5,000 Siemens wind turbines are producing clean, sustainable power for American homes and businesses across the nation. And, because our wind turbine blades are manufactured in Fort Madison, Iowa, and our nacelles are assembled in Hutchinson, Kansas, we're also providing local jobs and contributing to economic security. And that unique blade we mentioned? It was digitally designed at the Siemens research facility in Boulder, Colorado.

By designing and manufacturing more efficient and more innovative wind turbines, Siemens is powering America and making things that matter real.

siemens.com/windinamerica

Opening Remarks

Quality Pot Is Changing The Drug War

By Peter Robison, Nacha Cattan, and Ben Bain

The street lieutenant fidgeting in a Ciudad Juárez pizza parlor deals drugs for Barrio Azteca, a gang that emerged from Texas prisons in the 1980s to control a chunk of illegal shipments from Mexico into the U.S. Southwest. Think *No Country for Old Men*—secret nighttime drops, murders, and a lucrative sideline in human trafficking and prostitution. Meeting with a reporter while his heavyset boss circles the block, the Juárez dealer is preoccupied with his hottest new product: handcrafted American-made pot.

He marvels at one medical marijuana operation he visited in Arizona. "There are tanks with a system that at a certain hour releases oxygen, water, and light like clockwork," says the man, who asked that his name not be used for fear of arrest or reprisals from other gang members. Connoisseurs in Juárez are noticing, he says; they're starting to demand Purple Haze or Kush from American dispensaries. Gang members bring the quality stuff back from the U.S. The prices are higher—about 200 pesos per gram, compared with 50 pesos for his usual product—but then so is the quality. "There's much more novelty, more variety," he says.

With marijuana now permitted in some form in 23 U.S. states, the usual flow of pot from south to north has slowed and, to a growing degree, reversed. This was never imagined as a benefit of Nafta. Now, the expanding U.S. pot industry is transforming the drug distribution patterns of the notorious cartels—forcing them to deal more exclusively in heroin, for example—and leading to both cultural and economic change in Mexico's own consumption of marijuana. Two opportunities may arise: a business boom for legal pot producers in the U.S. and the chance to concentrate the drug war on far more deadly substances.

The effects are being felt in Sinaloa, long the heart of Mexican pot production. Farmers there are ripping out marijuana planted on hillsides. "In our town, it's dropped because it's no longer a profitable business," says Mario Valenzuela, mayor of Badiraguato, the hometown of infamous drug lord Joaquín "El Chapo" Guzmán, who was arrested in 2014. Over the last two years, participation in a program that subsidizes farmers who plant crops like tomatoes or green beans instead of marijuana has increased 30 percent, Valenzuela says. He attributes the increase to the surge in U.S. production since legalization.

In the past, only a sixth of cannabis consumed in the U.S. was grown within the 50 states; today that's up to at least one-third, according to the United Nations. Pot from Colorado and California

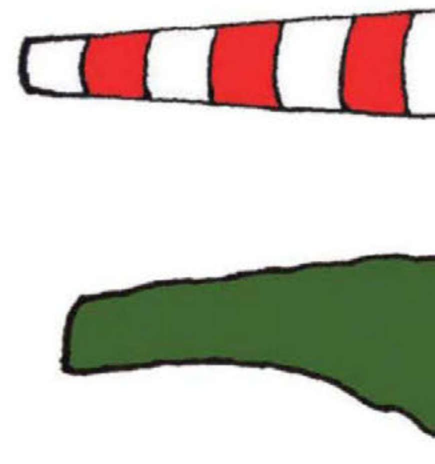


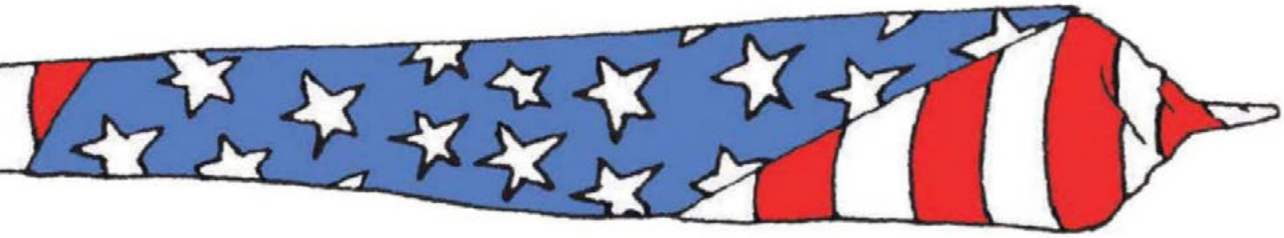
ILLUSTRATION BY SIMON ABRANOWICZ

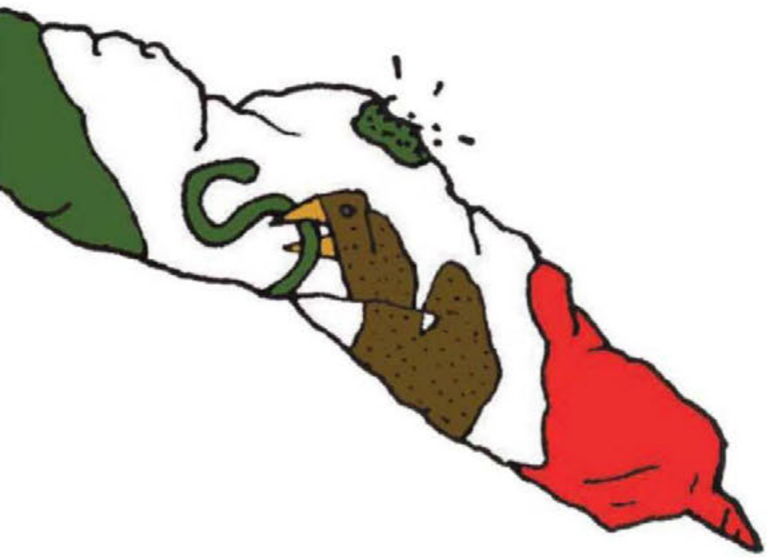
has started to displace the low-grade stuff that's long flowed in by truck, tunnel, human mule, and boat from Mexico. Marijuana seizures by U.S. Customs and Border Protection at California border crossings totaled 132,075 pounds in fiscal 2014, half of the amount five years earlier.

Colorado weed carries such cachet in both the U.S. and Mexico that entrepreneurs like Shawn Lucas, founder of a Denver grow-equipment supplier called Dutch Hort, say it could one day be a global brand. The state's burgeoning export prowess has already irked Nebraska and Oklahoma, where marijuana is still illegal. They claim a rise in crime related to pot from their neighbor and, in December, petitioned the U.S. Supreme Court to shut down Colorado's pot production. In Mexico City, young men mingling at an outdoor market and hawking *mota*—or pot—namecheck brands popular north of the border. By 2020, if marijuana were fully legalized, American sales might reach \$35 billion, says Matt Karnes, a former media analyst at First Union Securities who now runs New York-based cannabis researcher GreenWave Advisors. That's not much less than the \$38.5 billion Americans spent at pizza restaurants last year.

Lucas, 37, is typical of pot's shift to the mainstream. He started growing weed at 16 with seeds ordered from Canada. He opened shops selling nutrients, always taking care to speak in code with customers. At the time, only a few states allowed medical marijuana. "If you even hinted

With weed now permitted in some form in 23 U.S. states, the flow of cannabis out of Mexico has slowed and, to a degree, reversed





at the word ‘cannabis’ or ‘weed,’ I had to kick you out,” Lucas says. “I wasn’t going to go to jail for you.” He spent a few years in Shenzhen, China, developing contacts with manufacturers of the high-intensity-discharge lamps used by marijuana growers. Now, one of his Colorado clients has 6,000 lights, each retailing for $600. “I never thought I’d see that,” Lucas says. “This has been my entire adult career.”

Mexico has been wracked for years by the fallout of a bloody drug war, stoked by prohibitionist sentiment in the U.S. It began one Sunday in 1969, when President Richard Nixon ordered a surprise inspection of every vehicle crossing into the U.S. Now the border, made manifest by 650 miles of fencing, teems with Predator drones, ground sensors, and surveillance cameras. Turf battles made Ciudad Juárez one of the most violent cities in the world earlier in this decade, with 1,900 murders in 2011.

Mexico decriminalized possession of 5 grams or less of marijuana in 2009. A bill introduced last year would allow pot dispensaries like those in many U.S. states. “Why should we be killing each other over marijuana?” asks Mexico City lawmaker Vidal Llerenas, a backer of legalization. “We have a war here to prevent it from going to a country where it’s already legal.”

Mexican farmers are giving up on marijuana. Many switch to vegetables, but some opt for heroin poppies

While the bill has languished so far, momentum will grow if California approves recreational pot sales in a measure likely to appear on ballots in November 2016. “If California legalizes, you can’t politically sustain prohibition in Mexico,” says Jorge Javier Romero, president of a drug policy organization in Mexico City known as CUPIHD. Some 64 percent of Mexicans support allowing marijuana for medicinal use, according to an August 2013 survey by pollster Parametria—an eye-opener for a country that’s also one of the world’s most Catholic.

Some aren’t waiting for the state’s blessing. Carlos Zamudio, 37, helped open La Semilla Growshop in Mexico City in February, selling lamps and nutrients, often imported from the U.S. or Canada. One model on his floor, the XXXtreme 6 grow light, is made by Hydrofarm, a hydroponics supplier in Petaluma, Calif., near the state’s famed Emerald Triangle of pot farms. Zamudio says his grow shop is one of at least four in Mexico City. “The market is opening,” he says.

Pepe Pallán is trying to build a network of patients and doctors, even though medical marijuana isn’t officially allowed yet. A fan of the U.S. television series *Weeds*, about a drug-dealing single mom, Pallán, 38, hopes to go to California to attend Oakland’s Oaksterdam University, which calls itself the first “marijuana college.” Pallán tries to connect clients in Mexico City with doctors who agree to supervise treatment. He gets the pot from a grower who uses organic methods and avoids the cartels. “I’m not going into business with those guys,” he says.

Those guys are not going out of business, unfortunately. Mexico’s drug lords may have lost some profits because of U.S. legalization, but they’ve made adjustments. They’ve likely replaced volume lost from their pot trade with higher sales of heroin and methamphetamines, says Adam Isacson, a senior associate at the Washington Office on Latin America, a policy group. Some of the farmers abandoning weed are turning to cultivating poppies for heroin, helping fuel a near tripling in U.S. overdose deaths from the drug since 2010. Half of the heroin in the U.S. now comes from Mexico, up from 14 percent in 2009, the U.S. Drug Enforcement Administration says.

The drug war isn’t over. Yet there has been an historic change at the border. The fight can now focus on heroin and other deadly substances. The toll of the war on marijuana has been huge in terms of security and lives. Decades of prohibition never slowed the flow of pot from Mexico; legalization did. The choice is now who controls that flow: an unnamed dealer in Juárez or a legalized cross-border industry. Ⓑ

For Thomas J. Christensen on China's rising dangers and Noah Smith on politics in economics, go to

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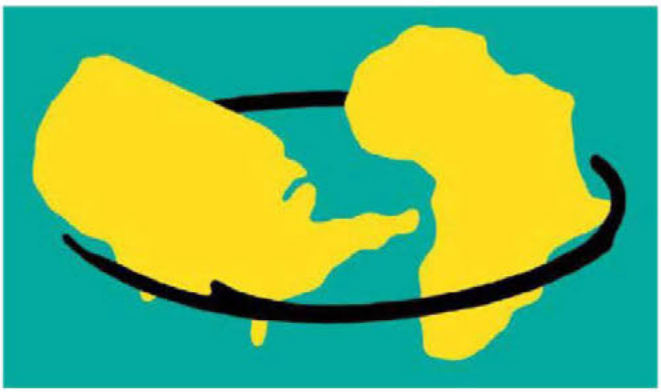
Renew the Africa Trade Pact

The House should follow the Senate's lead—and better it



Good ideas sometimes die not from opposition but from mere neglect. Case in point: the African Growth and Opportunity Act.

This is a free-trade deal between the U.S. and 39 sub-Saharan countries that expires in September. As Congress debates whether to give President Obama authority to conclude the better-known Trans-Pacific Partnership, the Africa agreement is in danger of slipping between the cracks.

Its expiration would be a heavy blow to the African countries that have received duty-free treatment on exports to the U.S. since 2001. Rather than simply renewing the pact, Congress should broaden it to cover more goods, including agricultural products and textiles—and extend it for, say, 15 years instead of the usual three. The Senate recently passed a simple 10-year extension, which would certainly be better than nothing. But the measure awaits approval in the House, and that's far from assured. Attention is bound to focus elsewhere.

The Africa deal has created U.S. jobs and millions more consumers for American goods. The criteria that countries must satisfy to participate have promoted democracy and market economics. The agreement has also helped counter China's growing influence.

Since the deal was first done, sub-Saharan Africa's record of growth has been good: 6.3 percent a year, more than double the rate of the previous decade and two percentage points higher than the global average. This year the region is forecast to grow 4.5 percent, outpacing Asia's projected 4.3 percent.

The trade deal has produced impressive successes. For instance, employment in Lesotho's clothing industry rose to about 46,000 in 2011, from 19,000 in 1999. U.S. retailers, including Gap and Kate Spade, now source goods in sub-Saharan Africa for export to the U.S. Apparel exports were worth $5 billion in 2013, up from $1.3 billion in 2001.

Africa's middle class should be of interest to U.S. exporters. McKinsey estimates the number of African households making above $5,000 a year, the point where discretionary spending begins, will rise from 85 million in 2008 to 128 million in 2020.

Skeptics have a point in saying it's not enough for the U.S. to throw open its doors when sub-Saharan countries lack reliable power, railroads, and basic infrastructure. The highway from Kenya's capital, Nairobi, to the border with Tanzania is so clogged it can take hours to drive 5 miles. Delays at border crossings and ports can be absurd. Container transit times from Kenya's southeast coast to Rwanda's capital, Kigali, have been cut to six days from 21—a big improvement, but still too long.

A bigger and better trade pact won't solve all of Africa's problems, but that's hardly the test. As somebody once said, "Money isn't everything, but lack of money isn't anything." The same goes for trade. Obama will visit Kenya in July—a fine occasion for an extended and improved African Growth and Opportunity Act.

How to Prevent The Next Cleveland

The Justice Department needs to take a more hands-on approach

The U.S. Department of Justice keeps finding police departments that use excessive force and ordering them to stop. It may be time for it to rethink its approach.

On May 26, the city of Cleveland entered into an agreement with Justice after investigators found evidence that its police department had a "pattern or practice" of using excessive force and violating residents' constitutional rights. Under President Obama, Justice has made similar findings in other cities. Many, like Cleveland, have agreed to federally imposed changes and monitors to ensure compliance.

None of this means these police departments are routinely breaking the law. Cities may enter into agreements to avoid the legal and political costs of fighting a "pattern or practice" lawsuit. But even if only some of the government's findings are correct, it's clear the problem is far from isolated. It demands a more hands-on solution.

Rather than waiting for the death or injury of a civilian, and then for protests to erupt over it, the Justice Department ought to establish standards that allow the public—and elected officials—to judge police actions. Through its investigations and close relationship with local law enforcement agencies, the department is well positioned to identify the rules and practices that are most effective at reducing the likelihood of excessive force.

Earlier in May, the department released a report by the President's Task Force on 21st Century Policing that contained dozens of recommendations. But reports by presidential commissions usually collect dust. While the department is funding pilot projects to help a few places carry out some of the recommendations, that's not enough. It ought to give clear guidance to police chiefs and the elected officials who oversee them on the standards of good policing so citizens can hold them accountable.

And if a city's leaders and federal officials disagree on the appropriateness of any practice, the public ought to know about it. Pressure brought by citizens can bring about change more swiftly than any federal lawsuit—and before tragedy strikes. Ⓑ

ILLUSTRATION BY OTHER MEANS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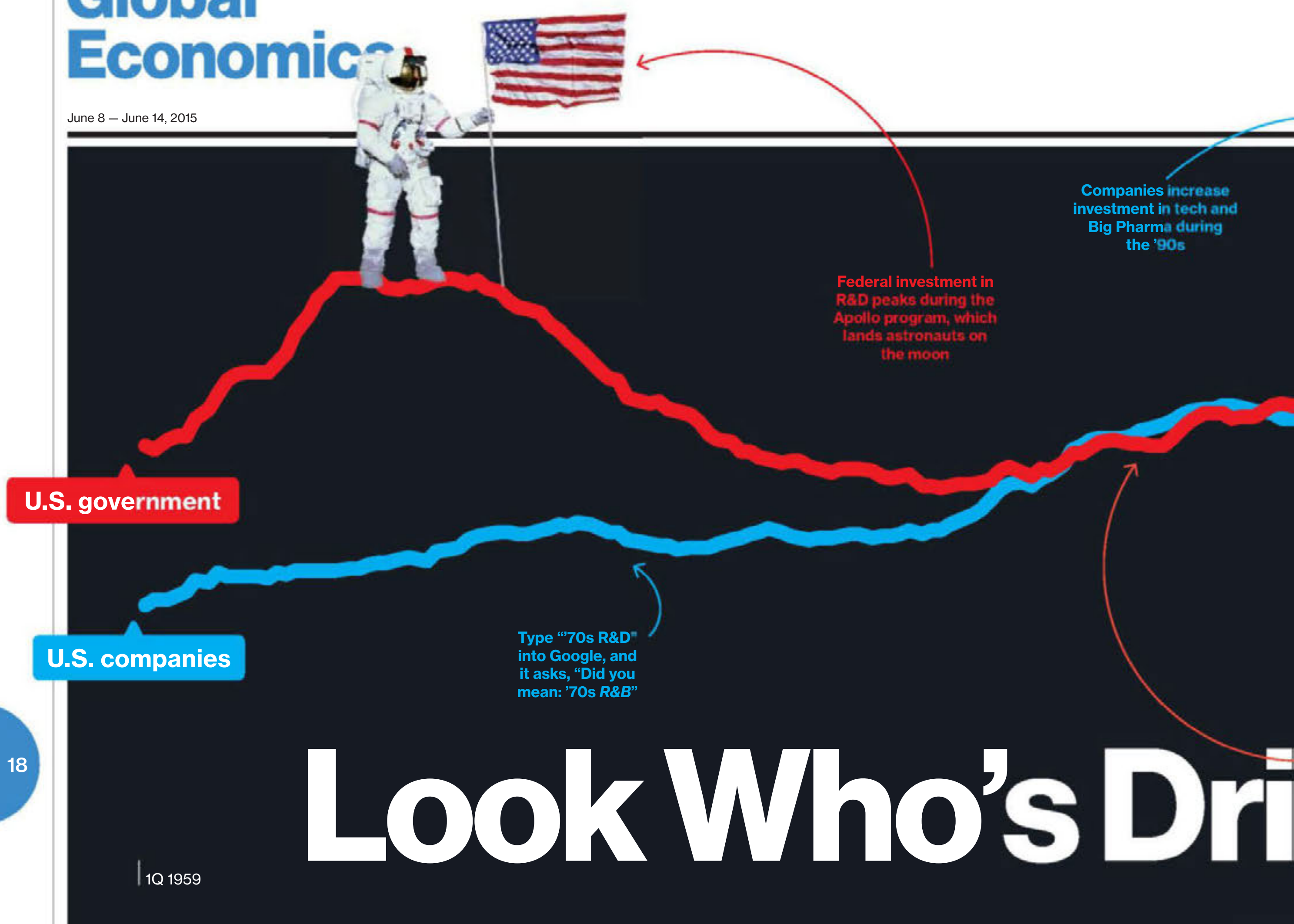


Look Who's Dri

▶ Companies spend to boost productivity, while government cuts back on research

▶ "In a way, this is what we've been waiting for. It's not quite Godot arriving, but it's close"

In June the U.S. economic recovery turns six. That's old: The average expansion since World War II has lasted less than five years. Yet in some ways, this recovery never really launched. Growth remains weak, averaging around 2 percent since the recession ended. Wages are rising barely above the rate of inflation, and productivity, that magic ingredient that allows us to do more with less, is historically low, growing at less than half a percent a year over the life of the recovery. All this has fueled suspicions that the U.S. has slipped into permanently low growth—what economists call secular stagnation.

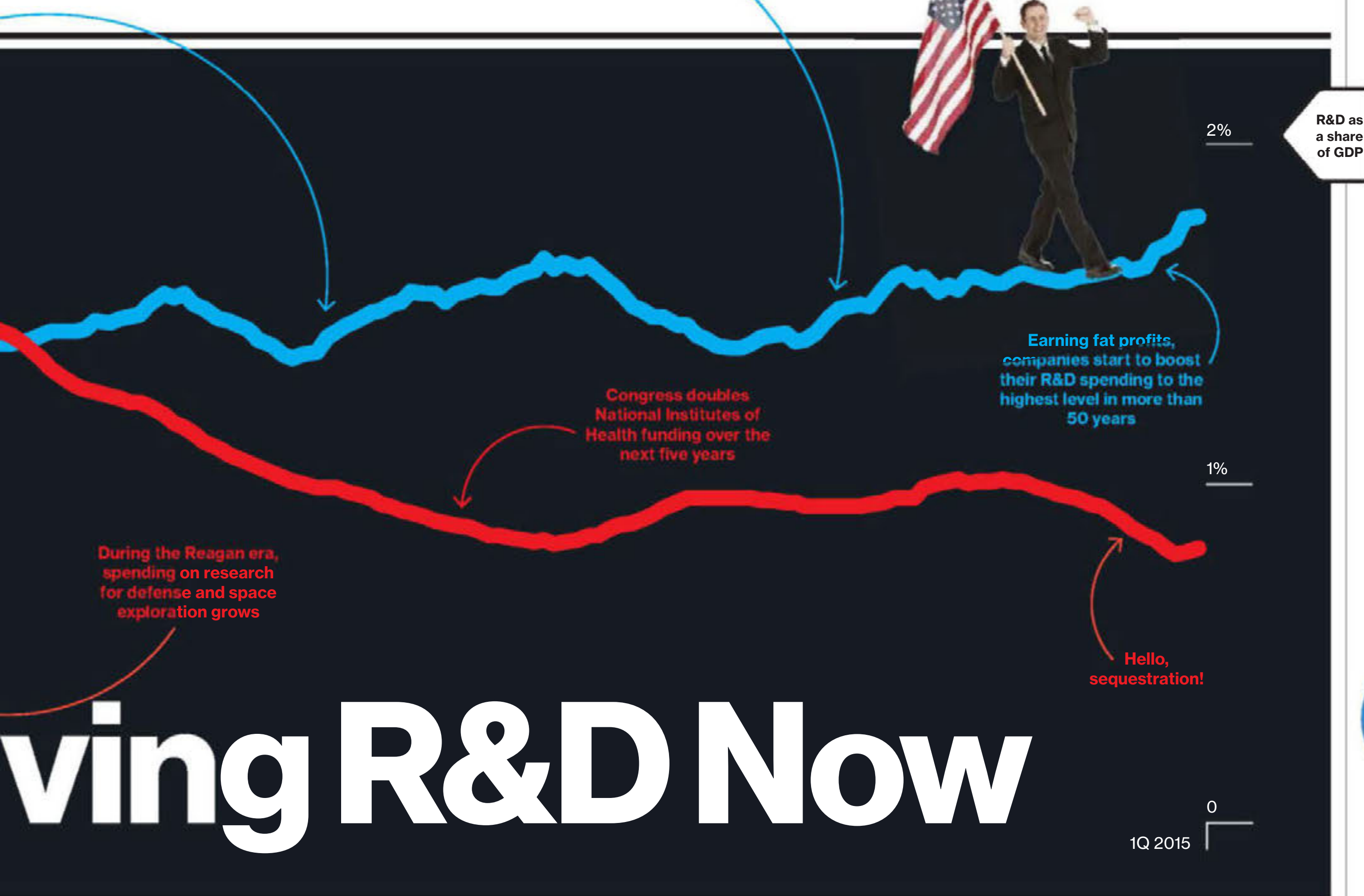
Yet there is hope on the horizon, if only a glimmer. Companies have been pouring money into research and development at the fastest pace in 50 years. From November through the end of March, U.S. companies funded R&D at an annual rate of $316 billion, or about 1.8 percent of gross domestic product, the largest share ever for the private sector. That's up from 1.7 percent last year and 1.6 percent from 2007 to 2014. "If secular stagnation is a 'thing,' then U.S. companies are investing like crazy to make sure it doesn't happen," says Neil Dutta, senior U.S. economist at Renaissance Macro Research.

After years of spending cash on dividend boosts and share buybacks, U.S. companies may finally be realizing they need to start seeding real innovation. To some economists, this marks a turning point as companies make the transition from engineering short-term profits to devising products and more efficient methods of doing business. "In a way, this is what we've been waiting for," says Torsten Slok, chief international economist at Deutsche Bank. "It's not quite Godot arriving, but it's close."

Slok is optimistic that more R&D spending will lead to new technologies, which in turn will encourage businesses to finally start investing in new equipment. That, he says, could have a domino effect by boosting worker productivity, which could raise wages and lead to higher growth rates. The process may already be under way. Orders for long-lasting goods such as equipment and machines rose in April, ending a recent downturn in capital spending.

Funding breakthrough technologies may be the last, best chance to get the U.S. out of its rut. If there are no breakthroughs, "then it's case closed," Dutta says. It can take decades for R&D spending to translate into inventions that make Americans better workers, if it happens at all. "The connection between R&D spending and the growth in productivity

COMPANIES LISTED REPORTED AT LEAST $1 BILLION IN ANNUAL REVENUE; R&D-TO-REVENUE FIGURES ARE FOR THE TRAILING 12-MONTH PERIOD; DATA: COMPILED BY BLOOMBERG



ving R&D Now

from one decade to another is very hard to see and unlikely to be significant," says Robert Gordon, an economist at Northwestern University who believes that U.S. growth has slowed permanently.

The private sector is also missing its old partnership with government. After peaking 50 years ago during the Apollo-era space race, federal R&D spending has fallen as a share of GDP from almost 2 percent in the mid-1960s to 0.8 percent in the first quarter of this year, the lowest level since World War II. The public-private partnership worked brilliantly in the postwar years, when industry turned the most promising advances from government labs into products such as GPS and the Internet. "That technology transfer is crucial, and it's not happening like it once did," says Marc Kastner, a former dean of the School of Science at the Massachusetts Institute of Technology. He and other MIT faculty wrote an April report, *The Future Postponed*, about the decline of federal investment in basic research.

Companies have played down such research as well. Back when **IBM** and **AT&T** had virtual monopolies, they spent lavishly on it without worrying about upstart rivals pressuring their margins. Today, with a more competitive market and more focus on short-term shareholder value, basic research is a much harder sell to the average chief executive. As a result, companies spend more of their R&D budget on enhancing existing technologies rather than discovering new ones. "It's the difference between coming up with evolutionary products instead of revolutionary ones," says Robert Atkinson, president of the Information Technology and Innovation Foundation (ITIF), a Washington-based technology policy think tank.

Companies that do spend a large share of their revenue on R&D mostly break down into two industries: information technology and pharmaceuticals. Driven by the ruthless reality of Moore's Law, which holds that the processing power of a chip doubles every two years, most tech companies have no choice but to keep spending; otherwise, they'll be left behind. There is evidence that drug companies have slowed their R&D spending. According to Deloitte, the return on R&D investments by the 12 biggest biopharmaceutical companies fell from 10.5 percent in 2010 to 4.8 percent in 2013.

There is one thing the government could do besides spending more on ▶

Big Spenders

U.S. companies with the highest R&D budgets, as a percentage of their revenue

Company	Sector	R&D/Revenue
1. Twitter	Info. technology	46%
2. Regeneron Pharmaceuticals	Health care	43%
3. Cadence Design Systems	Info. technology	38%
4. Synopsys	Info. technology	34%
5. Mentor Graphics	Info. technology	31%
6. Autodesk	Info. technology	29%
7. Bristol-Myers Squibb	Health care	29%
8. Celgene	Health care	28%
9. Broadcom	Info. technology	27%
10. Yahoo!	Info. technology	27%

FROM LEFT: NASA; ISTOCK/GETTY IMAGES

◀ R&D: make permanent the R&D tax credit, as the House of Representatives voted to do in May. Since its introduction in 1981, the tax credit has been copied and improved upon by a number of countries. According to a 2012 report by ITIF, the U.S. now ranks 27th in terms of the generosity of its R&D tax credit, behind such countries as Malaysia, India, and France. That's one reason U.S. companies have boosted their overseas R&D spending 2.7 times faster than what all companies have spent inside the U.S.
—*Matthew Philips and Peter Coy*

The bottom line From November through March, U.S. companies funded R&D at an annual rate of $316 billion, a record.

Elections

Turkey's Vote Turns Into An Erdogan Referendum

▶ **The president wants more power, and voters want a better economy**

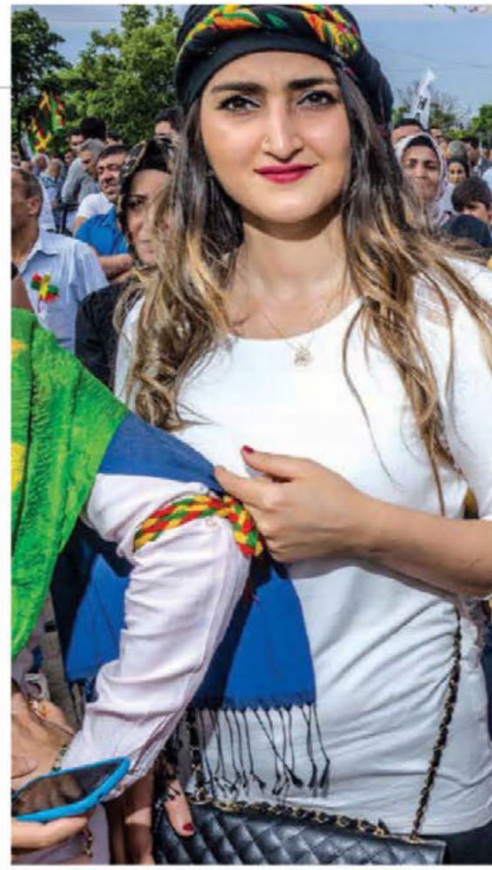
▶ **The "AK Party finds itself following the economic agenda"**

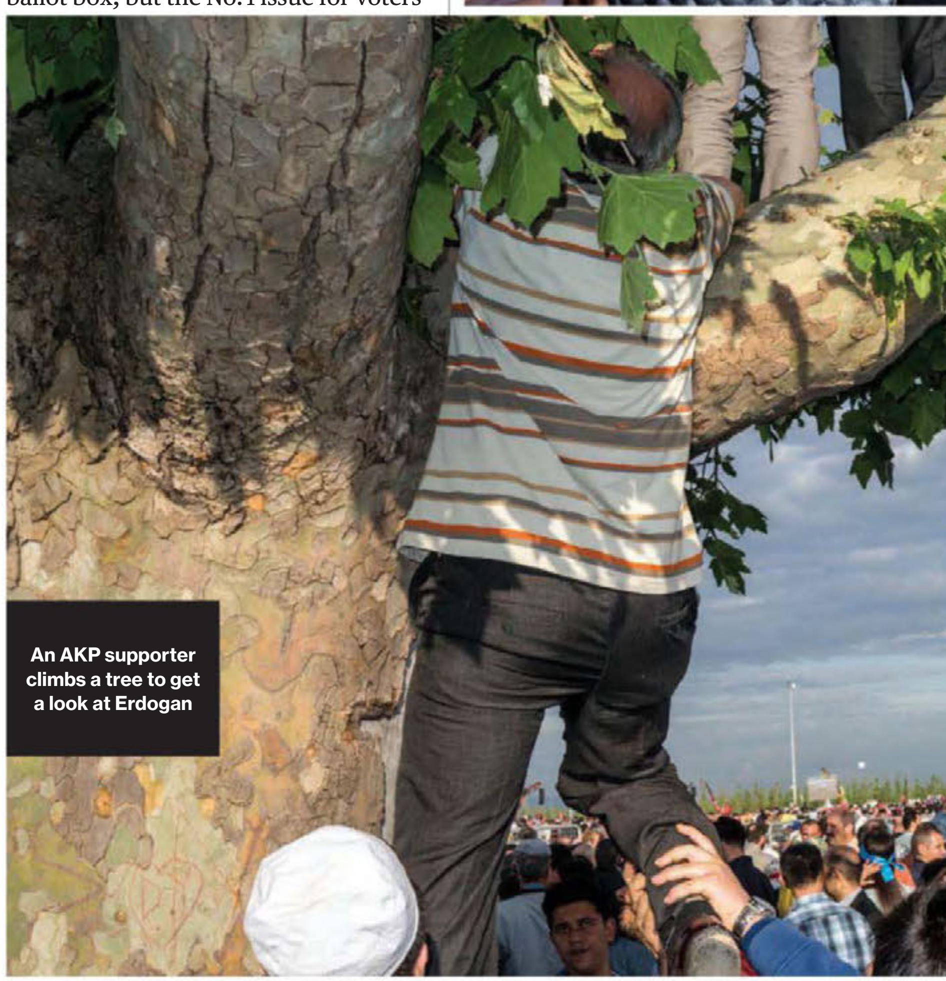
On Sunday, June 7, Turkish voters will go to the polls to elect members of the country's parliament. President Recep Tayyip Erdogan, the former prime minister, is not up for reelection this year. Yet he is at the center of the campaign and Turkey's struggle to see its way forward. Under Erdogan's leadership the ruling Justice and Development Party (AKP) has had an unbroken string of electoral victories since 2002, largely on the strength of its economic record. The AKP government of Erdogan tamed a chronic budget deficit, lowered inflation, and fostered the interests of the Islamist business class in Turkey's interior.

Things have changed. Under AKP internal rules, Erdogan can't serve in parliament and be prime minister more than three terms consecutively. So voters elected him president, traditionally a ceremonial and nonpartisan post in Turkey. Yet he is campaigning hard for the AKP. If it wins an overwhelming majority in the parliament, it can successfully vote to change the constitution and switch the real political power in Turkey from the parliament to the presidency. Then Erdogan could conceivably run Turkey until 2024, when term limits take effect.

Erdogan's focus on political transformation has left the AKP vulnerable to attack on its recent handling of the economy. The Turkish lira has slid 13 percent in value against the dollar. The president has quarreled publicly with the head of the central bank for raising rates sharply to curb resurgent inflation and lower the economy's dependence on imports. Growth, which averaged 5 percent through most of the Erdogan era, will likely drop to 3.2 percent this year, slow for a country that needs to create jobs for a young population. If the U.S. Federal Reserve raises rates, many market investors will probably drop Turkish bonds for American Treasuries, weakening the lira more. Consumer confidence is at depths last seen during the global financial crisis.

"For the first time, AK Party finds itself following the economic agenda rather than setting it," says Cagdas Sirin, an economics professor at Bahcesehir University in Istanbul. "I don't know whether this will be reflected at the ballot box, but the No. 1 issue for voters





An AKP supporter climbs a tree to get a look at Erdogan

PHOTOGRAPHS BY GUY MARTIN FOR BLOOMBERG BUSINESSWEEK

Supporters of the HDP espouse leftist views and more rights for Kurds

is the economy." The AKP has been leading the polls, but keeping its parliamentary majority is uncertain.

Opposition parties are making generous promises to win votes. The main opposition, the secularist Republican People's Party (CHP), says it will raise the monthly minimum wage by 50 percent to 1,500 liras ($560), lower the price of diesel fuel for farmers, and build affordable housing for poor and middle-class voters. The pro-Kurdish People's Democratic Party (HDP) has proposed a minimum wage of 1,800 liras.

For Huseyin Yildiz, a previous AKP voter who says his watermelon business in an Ankara market is slow, higher minimum wages have their appeal. "I hope they can keep their promises," he says of the opposition. "That means more money for everyone. Who doesn't want that?" In response, Deputy Prime Minister Ali Babacan has warned that the opposition's minimum wage proposals would turn the country into another Greece. There are also concerns that Erdogan's imperious style is eroding the rule of law. The president's lawyers are opening hundreds of lawsuits against people for insulting him. The courts have detained dozens of journalists for allegedly writing insults in social media, getting involved in coup plots, and supporting Kurdish terrorists.

Most election surveys show combined support for the CHP and the Nationalist Movement (MHP) at more than 40 percent, close to the AKP's predicted result. If the HDP passes the 10 percent total vote threshold needed to enter parliament, no party may win enough seats to form a government alone.

Investors may not see the lack of a single-party majority as a bad thing, according to Abbas Ameli-Renani, global emerging-markets strategist at asset manager Amundi in London. He said in an e-mail, "After 13 years of absolute majorities for the AKP, a weaker vote of confidence may be exactly what is needed to refocus the party's attention on the economic reform agenda that defined its earlier years in power." —*Onur Ant and Ali Berat Meric*

The bottom line Although Turkey's AKP has dominated the polls for a decade, its lead in this parliamentary election has narrowed.

Cities

China Slowly Starts to Tame Its Traffic

- Second-tier cities have learned from Beijing's mistakes
- Cities should "plan for growth, rather than simply react to it"

During rush hour on Beijing's most congested highways and streets, bicycles and vegetable carts rattling down sidewalks move faster than auto traffic, whether you're riding in an official's shiny new Audi or a Volkswagen taxi. But there's actually some good news about China's struggle to manage its traffic. The swift rise in car ownership in Beijing has slowed, thanks to a license plate lottery—a Beijinger can drive a car only if he has a license plate to put on it. More important for China's future, the less developed tier-2 cities are learning from Beijing's mistakes.

The lottery eased congestion measurably in 2011, the year it started, says Anthony Liu, an economist at Cheung Kong Graduate School of Business in Beijing, who published an examination of the policy last year in the journal *Energy Policy*. "The lottery slows down the growth in car [ownership], while allowing other policies to take hold, such as expanding public transportation systems," says Liu. Beijing has added three lines to its subway and expanded five since 2011. An additional six lines are being planned. The system is expected to have 1,000 kilometers (621 miles) of track by 2020, up from 527 kilometers now. The lottery now allots 130,000 plates per year, down from 240,000 when it first started.

Beijing offers lessons in what not to do, as well. Fifty-seven percent of Beijing's 22 million residents live in the city outskirts, between the third and sixth ring roads, according to figures ▶

released in late May by the city government. Yet the best hospitals and schools lie within the second ring road along with the central business district and Financial Street. That makes for long inbound commutes. "China's first-tier cities' urban layouts are already locked into position, which makes it hard to take measures to change traffic flow," says Lulu Xue, a research analyst at the World Resources Institute China, an environmental nonprofit in Beijing. "It's better if cities can plan for growth, rather than simply react to it."

As an example of foresight in planning, Xue cites Chengdu, a prosperous tier-2 city of 14 million in southwestern China. In December 2011 the city designated a development zone to its west, called Tianfu New Area, which is still under construction. The plan combines green areas with residential and industrial space. The goal, Xue says, is to "promote decentralization of jobs and key facilities—such as schools and hospitals—instead of clustering them all in one center." In a similar development, the central government is moving some of its ministries to a new town near Baoding, which is about 150 kilometers southwest of Beijing.

Chengdu has made alternatives to commuting by car more attractive. Each morning, 32-year-old Wu Shiling commutes 5 kilometers by bike to his office at a nonprofit. Biking to work used to be common in Beijing, but sharing the road with an increasing number of automobiles is enough to rattle anyone's nerves, and riders are often blasted with exhaust. Wu's ride in Chengdu is more pleasant because along major roads the city has built wide tree-shaded lanes for bikes and scooters, separated from the main road by grassy medians.

Beijing's lottery for license plates

In many Chinese cities, bus schedules are unreliable. Chengdu, when it was planning its second ring road, made room in the plan for two lanes—one in each direction—for Bus Rapid Transit. This allows buses to move more quickly and predictably. During rush hour, Chengdu's BRT vehicles are full. The city is also expanding its new subway system, from 2 lines to 10. Other second-tier cities, including Kunming and Urumqi, are building or expanding rapid transit bus systems and metros.

To control traffic, "there's no magic bullet," says Liu, the economist. "Around the world, all these developing cities in fast-growing countries, they're all experiencing some gridlock." China's leaders now recognize and are trying to tackle the issue, he says. "China has done some of the most creative and aggressive attempts to rein in congestion. It's not easy." —*Christina Larson*

The bottom line Chinese cities are running license plate lotteries, building bus lanes, and expanding subways to slow traffic.

Safety

In India, Some Pilots Can Barely Fly

▶ Many flight schools give trainees certificates with few flying hours

▶ "The fudging of log books is rampant," says a certified pilot

Anupam Verma has a certificate that says he's flown an aircraft for 360 hours. He got it, he admits, after sitting in the co-pilot's seat for just 35 minutes. He shudders to think of what would have happened if he'd gotten a job flying a commercial airliner on the strength of that piece of paper. "What if I was flying and had an emergency? I wouldn't even know how or where to land," Verma, 25, says. "We'd kill not only the passengers, but we might crash in a village and kill even more people."

"What if I was flying and had an emergency? I wouldn't even know how or where to land." —*Anupam Verma*

Verma's certification came from an aviation school called Yash Air in the city of Indore. The school gave its students almost no training, collected fees of 2.8 million rupees ($44,000) per student, spent as little as possible on aircraft and fuel, and handed out certificates inflating flying hours, according to court documents and interviews with pilots, regulators, and industry analysts.

Concern about pilot quality has been building ever since the proliferation of budget airlines in India created demand for more people to fly planes. In 2011 the government reviewed the licenses of all 4,000-plus professional pilots in India. Police investigated at least 18 people for using forged documents to win a promotion at an airline or win certification from a flight school.

The findings of the review weren't made public, but pilots, regulators, and industry consultants say that for years flight schools have been graduating unprepared pilots. "The fudging of log books is rampant," says Mohan Ranganathan, a former commercial pilot and now an aviation safety consultant based in Chennai. He says the 2011 audit found violations in most flying clubs, groups of hobbyists who started aviation schools. These schools' profits are higher if their students don't fly the full 200 hours mandated by regulators. "One aircraft had no engines but several hundred hours were logged" on it, says Ranganathan, who's advised the Directorate General of Civil Aviation (DGCA). Asked by reporters about the continued use of fake certificates, M. Sathiyavathy, India's director general of Civil Aviation, said on April 24 that the directorate would audit the flying schools again.

Once pilot trainees get a pilot's license from the DGCA, the airlines can't fire them. Instead airlines must do costly remedial training. S Varadarajan, spokesman for **Tata SIA Airlines**, says it's aware of overlogging but tests pilots and does its own training. **SpiceJet**'s spokesman Ajay Jasra says it only hires from prestigious air schools and tests and trains new pilots.

Verma says he enrolled in December 2009 at Yash Air, after he'd received a 2.8 million rupee scholarship from the government. On his first day, he says he was taken on a 35-minute "air experience" flight. Moments after the aircraft landed, he was handed a document certifying he had flown 360 hours. He was told he would fly those hours during the course: He only logged three hours.

Verma and other trainees complained, but Yash Air employees ignored them, Verma says. He sued to get his grant money back, as did others, and the Allahabad High Court ordered in November 2012 that his fees be returned. "Several discrepancies have been noticed with regard to overlogging of flight details, flight authorization, maintenance of various log books, and fuel consumption registers," reads a DGCA inquiry into complaints about Yash Air in June 2014. The school has changed its name to Centaur Aviation Academy. Attempts to reach it and Yash Raj Tongia, the owner and main trainer, were unsuccessful. The DGCA says Centaur Aviation is no longer an approved flying school.

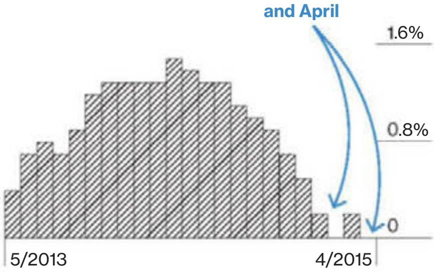
Tongia was appointed in 2011 as the DGCA's director of flying and training. ▶

LI WEN/XINHUA/ZUMA PRESS

The Bank of Japan's Fight to Raise Inflation

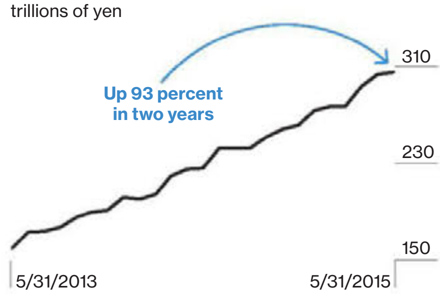
Prices are stagnant...

Consumer price index; year-over-year change



...while the BOJ pours on the money...

Currency in circulation plus banks' reserves; trillions of yen



...and binges on government bonds.

Bank of Japan's biggest assets, as of May 26; trillions of yen

Record high

237 Long-term government bonds

7 Stocks, ETFs, and REITs

52 Discount Treasury bills

3 Corporate bonds

28 Loan programs to spur growth and lending

2 Commercial paper

CPI STRIPS OUT THE IMPACT OF THE APRIL 2014 SALES-TAX INCREASE AND EXCLUDES FRESH FOOD; DATA: JAPANESE MINISTRY OF INTERNAL AFFAIRS AND COMMUNICATIONS, BANK OF JAPAN

◀ Later a DGCA report described his flying skills as "below standard" and said his appointment to the directorate "does not appear to be proper." According to court documents, "the services of Sri Yash Raj Tongia…have been terminated with effect from 17th July, 2014."

Undertrained pilots keep applying for jobs. One who asked not to be named because it may harm his career says he completed fewer than 120 of the 200 hours his certificate says he's done. He says he's applying to **IndiGo**, India's biggest carrier. Another pilot, who says his certificates inflate his time flying solo, applied to **Air India**. Neither has been hired by the airlines. As for Verma, after a four-year legal battle to get his grant back from Yash Air, he says he's been admitted to a reputable government-run flight school. He starts this year. —*Anurag Kotoky*

The bottom line The proliferation of discount airlines in India has encouraged some pilot schools to cut corners on training.

Monetary Policy

The Bank of Japan Can't Jump Start Inflation

▶ Years of pumping money into the economy hasn't raised prices

▶ "It's really too early to say Kuroda's easing didn't work"

On May 29 the Japanese government announced that the country's consumer prices were unchanged in April from a year earlier, calling into question the power of the central bank's effort to drive prices upward. The BOJ is acting a bit like a hedge fund, trying any investment to achieve its goal of raising inflation to 2 percent. It's snapping up not only government bonds but also exchange traded funds, corporate bonds, real estate investment trusts, and venture capital loans—anything to put more money into lenders' and investors' hands so they can lend and invest more. "The BOJ deserves the most aggressive award among central banks," says Yasuhiro Takahashi, a senior economist at Nomura Securities.

The latest consumer price report underscores the difficulty of the central bank's task. BOJ Governor Haruhiko Kuroda doubled down last October and expanded his policy, formally known as quantitative and qualitative monetary easing. The central bank pledged to raise the monetary base from 60 trillion yen ($482 billion) a year to 80 trillion yen to give banks more money to lend.

The heroic effort has driven the Nikkei 225 Stock Average to a 15-year high and the yen down to almost a 12-year low against the dollar. Although that's delighted stock investors and big exporters such as **Toyota Motor** and **Shiseido**, it hasn't moved the needle on overall growth or inflation. A majority of 36 economists surveyed by Bloomberg see the BOJ beefing up its program by late October, when it's expected to update its inflation forecast. If that's less than 2 percent, the bank will pile on extra stimulus.

Nomura predicts the central bank will switch its focus from bonds to stock purchases next spring, betting a bull market might more effectively stimulate consumer spending. The brokerage sees the BOJ doubling its ETF purchases, to 6 trillion yen, while announcing plans to taper its bond purchases.

Kuroda has said that the plunge in oil prices in the short term delayed progress on generating inflation and that rising wages will engender growth, consumer spending, and higher prices. "It's really too early to say Kuroda's easing didn't work," says Takahiro Sekido, a former BOJ official who's now a strategist at Bank of Tokyo-Mitsubishi UFJ.

Japan faces structural challenges, given its aging, shrinking population and its debt burden, the biggest in the developed world. "The BOJ's policy has been and must be more ambitious," says former Fed Vice Chairman Donald Kohn, now at the Brookings Institution. "It's not going to be easy to break expectations [of deflation] that have been entrenched over the decades."

Fiscal conservatives question the BOJ's bond-buying, which soaks up about 90 percent of all new government bonds issued to keep long-term rates low. If long-term rates returned to their historical average of 3 percent, from 0.4 percent now, the higher interest payments would push the budget deficit from 8.5 percent to 13 percent of gross domestic product, according to the Organisation of Economic Co-operation and Development. "The BOJ is approaching its limit in bond purchases," says Nomura's Takahashi.

Kuroda continues to enjoy the steadfast support of Prime Minister Shinzo Abe, who picked him to run the BOJ in 2013. Abe, though, has so far failed to deliver on the promised labor, tax, and regulatory reforms that economists say are needed to get Japan back on track. Monetary firepower alone won't revitalize the economy. —*Brian Bremner, Toru Fujioka, and Enda Curran*

The bottom line If long-term rates return to a more normal 3 percent, Japan's budget deficit could rise to 13 percent of GDP.

Edited by Christopher Power
Bloomberg.com


HITACHI
Inspire the Next
"ARE THERE REAL SUPERHEROES TO KEEP OUR CITIES SAFE?"
Maybe someday. But with our cities becoming so populated and complex, we're going to need other ways to answer their security needs. That's why, at Hitachi, we've developed some super smart solutions that address both the physical and cyber sides of the issue. For instance, to keep public facilities like schools and bus stations safe, we already have advanced monitoring and disaster response support systems. We also have innovative data protection systems to detect and prevent cyberattacks and keep the personal information on your computer personal. And those are just a few of the ways we're helping keep cities safe, until the real superheroes appear. Hitachi Social Innovation.
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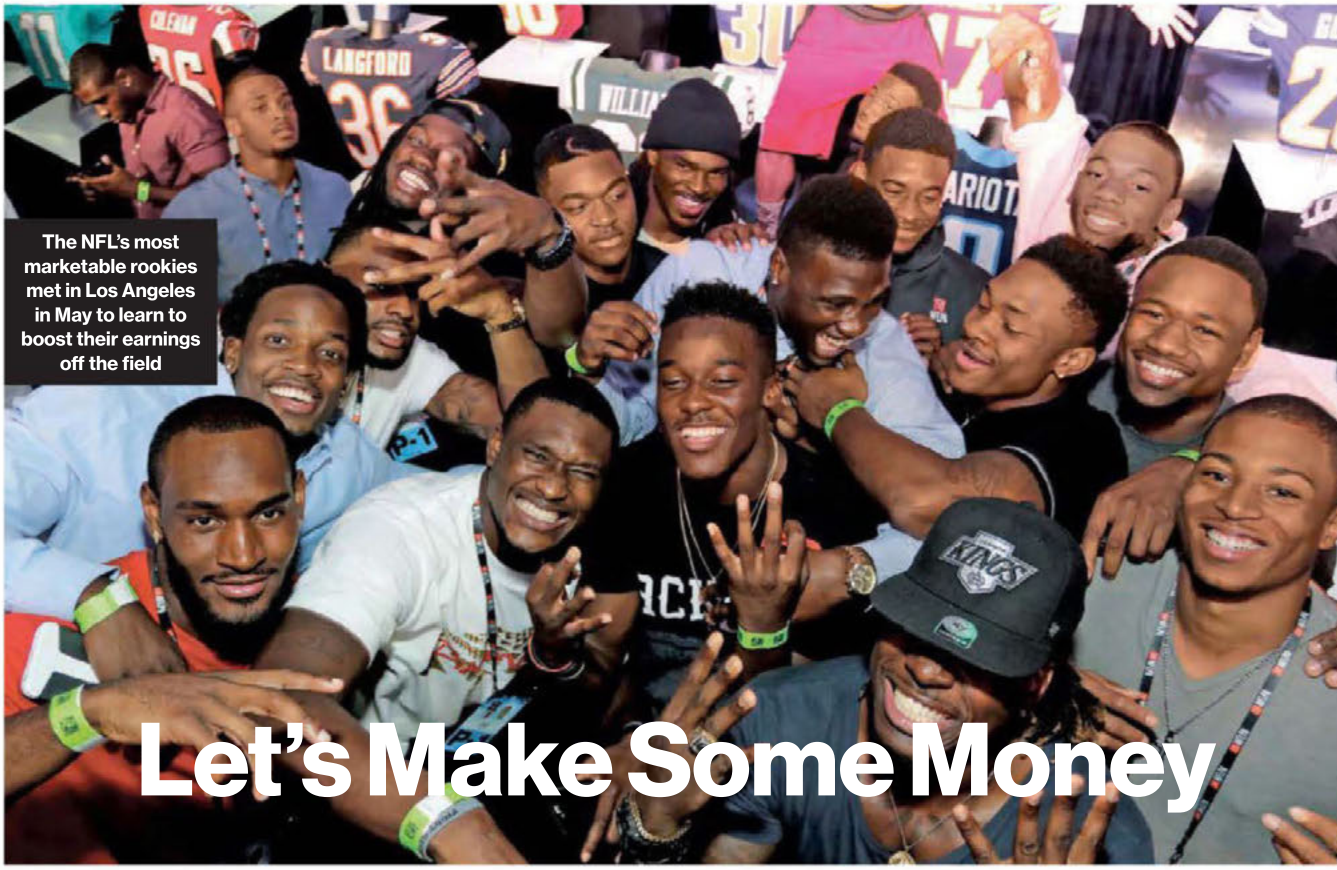
THINK IN THE NEXT

June 8 — June 14, 2015



The NFL's most marketable rookies met in Los Angeles in May to learn to boost their earnings off the field

Let's Make Some Money

▶ The NFL Players Association rolls out a new playbook for rookies: How to maximize their incomes

▶ "I want everyone in this room to get more out of this business than this business gets out of them"

Forty-one first-year players in the **National Football League** are on their feet in a ballroom at the JW Marriott Los Angeles hotel. Former NFL linebacker Don Davis, now player advocate for the NFL Players Association (NFLPA), is at the front of the room to deliver a locker room-style pep talk before a long day ahead.

"So we are a what?" Davis asks.

"Family," the players reply on cue.

"And we are here on what?"

"Business."

"And the one thing that businesses do?"

"Make money," the rookies chant.

Although the regular season doesn't begin until September, NFL teams have already begun putting players through their paces on the field. But these players—the most celebrated of their draft class, including the two quarterbacks selected first and second, Jameis Winston of the Tampa Bay Buccaneers and Marcus Mariota of the Tennessee Titans—have been excused for a training camp of a far different kind: a four-day introduction to the business of football.

The NFLPA Rookie Premiere began as a photo shoot in 1993. **Upper Deck**, the trading card maker, wanted images of newly drafted players, in uniform and on a field, to use on cards before the season began. With the union's help, they gathered about a dozen players in Los Angeles. The following year the union established a for-profit subsidiary, **NFL Players Inc.** (NFLPI), to sell group marketing rights for players. The union and its new sales wing decided to turn the preseason photo op into an event to showcase its newest players and to teach them about moneymaking opportunities off the field. The first official Rookie Premiere came a year later, in 1995.

The NFL and its owners control the rights to team names, logos, and uniforms. But any company that wants to use the names, likenesses, numbers, or signatures of six or more NFL players in its product or ads has to go through NFLPI. A player's agent can line up individual deals with any brand, but once that brand signs more than five players, it needs group rights as well. Leaguewide sponsors such as **FedEx** and **PepsiCo** get group rights to both players and teams through an agreement between the NFL and the union. Licensees, such as **Electronic Arts**, maker of the popular Madden NFL video game, buy player and league rights separately.

NFLPI logged $145 million in revenue last year from about 30 sponsors and 80 licensees, says President Ahmad Nassar. The total is up almost 50 percent from six years ago, when Nassar arrived. That's still puny next to the league's $12 billion in annual revenue, mostly ▶

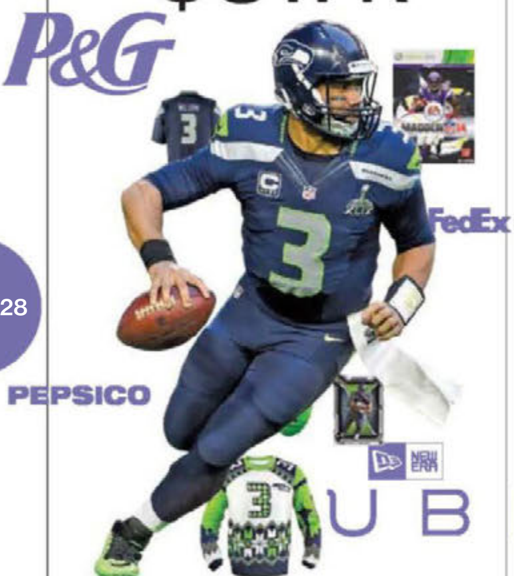
COURTESY KEVIN A. KOSKI/NFLPA

Money Ball

NFL Players Inc. took in **$145 million** last year from sponsors and licensees. It pays **$13,000** apiece to 2,000 active players. An additional **$60 million** gets distributed based on sales linked to individual players.

Quarterback Russell Wilson's 2014 salary from the Seattle Seahawks was

$817k



NFLPI paid him

$1.5m

◀ from sales of TV rights. NFLPI aims to grow by pitching itself to marketers as a one-stop shop for reaching players eager to work with brands. "I want everyone in this room to get more out of this business than this business gets out of them," DeMaurice Smith, NFLPA's executive director, tells this year's Rookie Premiere class in L.A.

One of the event's first sessions brings home the fragility of the class's personal brands: Players get to react to simulated letters informing them that they've been suspended for failing NFL drug tests or that their "girlfriend Boo-Boo" filed a domestic violence charge. When it comes to sponsorship opportunities, says George Hegamin, another ex-player working for the union, "a lot of this is what you do, and what you don't do, off the field."

Trading card makers **Topps** and **Panini America** still play a major role at Rookie Premiere. They help select the invitees, with a focus on players "who are going to be collectible," says Jason Howarth, vice president for marketing at Panini America. That means mostly quarterbacks, running backs, and wide receivers. As Howarth speaks, Winston, Mariota, and Karlos Williams, a running back for the Buffalo Bills, sit in a conference room signing stacks of trading cards and sheets of plastic film. *Errrybody* by Yo Gotti blares from speakers to help keep their energy up.

On the third day of the event, the players head to the Los Angeles Memorial Coliseum, put on helmets, pads, and jerseys, and strike poses for the cameras. These pictures will be on cards for the next few months. "We will have released seven or eight products before they even step on a field for real on a Sunday," says Howarth.

The trading card signing sessions are just two of the 15 "content capture" activities for the rookies over two days. The rotations are part grind, part gravy train. In one room, players put on bright green, orange, and purple T-shirts and pose for a FedEx digital marketing campaign. Two doors down at game maker EA, each sits in front of a 12-camera rig that captures their faces for rendering in Madden NFL. **Fanatics**, the company that runs the league's official online apparel shop, takes pictures of them in team hoodies and T-shirts and then videotapes brief interviews about their superstitions and favorite foods. **Samsung** gives each a free Galaxy S6 smartphone; clothier **Elevée** fits them for free suits. The companies pay an undisclosed fee to set up shop at the hotel, and NFLPI pays each player to hit all the stops.

In the fall, the union will send each of its 2,000 active members a check for about $13,000, their equal share of the year's NFLPI bounty. An additional $60 million gets paid out over the course of the year to individual players based on the sales of jerseys and other items linked to them. Last year, Nassar tells the rookies, Russell Wilson made almost $1.5 million from NFLPI, roughly double the $817,302 the quarterback earned in salary from the Seattle Seahawks. The union uses the rest of the NFLPI revenue, about $60 million, for its operating budget.

The Ravens' Buck Allen poses for a promotional shot

NFLPI says video games, mostly EA's Madden franchise, account for $35 million of its revenue. Trading cards and other collectibles bring in $33 million. Apparel brands, led by **Nike**, add $21.5 million. And $55 million comes from sponsors. NFL players' names, faces, and numbers can be found on gummy candy, plush toys, mobile video games, plastic figurines, ugly holiday sweaters, and socks. *License! Global* magazine says NFLPI-licensed products generate $1.34 billion in annual sales. That's 46th among licensors worldwide, between Sunkist Growers and Coca-Cola. (The NFL ranks 16th, with $3.5 billion in sales.) Nassar says NFLPI is willing to cut deals with partners of any size. "All these big Fortune 500 companies knew to call us," he says. "Now we're talking about not even Fortune 2,000 or 20,000, we're talking about two dudes in a garage." —*Ira Boudway*

The bottom line The Players Association's for-profit arm has seen its revenue jump almost 50 percent in six years.

Media

TV Gets Too Much of a Good Thing

▶ With more than 400 original shows this year, not all can make money

▶ A market "flooded with too many people chasing the same prize"

The entertainment industry will air more than 400 original TV shows this year, lavishing hundreds of millions of dollars on top talent and filming in exotic locations in hopes of creating the next *Mad Men* or *Game of*

Thrones. The gusher of quality programs has prompted TV critics to proclaim a new Golden Age of Television. But you'd have to watch 24 hours a day for at least eight months to catch every scripted series that aired last year. With all that competition for viewers, say industry executives, most original programs lose money, and half the shows now running will probably disappear by next year.

"The market is flooded with too many people chasing the same prize," says Jeff Wachtel, president of **NBCUniversal**'s cable unit, which includes the USA Network and Syfy channel. "What used to be the Golden Age of Television has now become a Gold Rush."

Of the 352 scripted series that aired last year, 199—up sevenfold since 2000—came from basic cable channels such as **AMC Networks** and pay channels such as **Time Warner**'s HBO. An additional 129 ran on broadcast networks such as **CBS** and **Comcast**'s NBC. And 24 came from streaming services such as **Netflix** and **Amazon.com**'s Prime service.

But while programmers are pumping out ever more shows, total TV audiences are dwindling. The number of 18- to 49-year-old viewers—those most coveted by ad buyers—watching cable TV live or on demand within three days of a show airing has fallen 11 percent this season from the year before, according to researcher MoffettNathanson. One reason: viewers ditching cable-TV packages for cheaper online alternatives such as Netflix or Hulu.

It typically costs about $3 million to produce an hour of scripted television, according to a cable network executive who's not authorized to speak about the matter. Cable networks pay about 70 percent of that, or about $2 million, for the rights to put the show on TV. They recover their costs in two main ways: selling ads and charging fees to the likes of Comcast or **DirecTV** to carry their channel.

To generate enough ad revenue to recover what a cable network pays a studio, a show must average about 3 million viewers in the 18- to 49-year-old demographic within three days of airing, the executive says. But of the 199 original series on cable last year, only six averaged that many viewers after seven days—a less stringent industry metric. They include AMC's *The Walking Dead* and *Sons of Anarchy* on **21st Century Fox**'s FX network.

Making matters worse for programmers, viewers increasingly binge-watch weeks or months after a program originally airs. Advertisers don't pay for that long-delayed viewing, leaving networks with fewer ad dollars to buy more original programming.

Cable networks can turn a profit by raising the fees they charge pay-TV services to carry their channels. But to make those hikes stick they need bona fide hits. The cable networks also can recoup more of their programming costs by wringing extra revenue out of shows made in-house—selling reruns, international rights, and series to Netflix or Amazon. Those two services, along with HBO and CBS's Showtime, are less affected by the content glut because they get most of their money from subscriptions and largely use original programming to attract and retain subscribers.

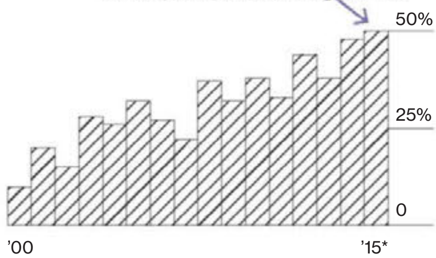
Everyone wants to duplicate the success of AMC's *Mad Men*, which recently finished a seven-season run. A decade ago, AMC was a small cable network that mostly aired old black-and-white movies. Since *Mad Men*'s debut in 2007, AMC has boosted fees from cable and satellite distributors by more than 75 percent and increased advertising revenue by nearly 200 percent, according to an industry analyst who asked not to be identified discussing proprietary information.

But *Mad Men* began with mostly unknown actors. Now producers are signing up big-name actors such as William H. Macy and Robin Wright as well as top directors like Martin Scorsese and Woody Allen. Expensive locations are increasingly common. As a result, production costs are soaring. One Season 2 episode of *Game of Thrones*, shot in Northern Ireland and requiring the building of a replica of a 14th century battleship, cost $8 million.

The Ax Gets Sharper

Cancellation rate of original scripted TV shows on broadcast networks, cable, and streaming services

Half the series that ran in 2014 aren't expected to come back this year



With audiences thinning and fragmenting as never before, dozens of cable shows limp along in relative obscurity. Though critically acclaimed, **FX**'s spy drama *The Americans* ranked 46th among scripted series on cable TV last year, drawing about 1.3 million viewers in the 18- to 49-year-old demographic. USA's *Satisfaction*, about a couple trying to rekindle their marriage, ranked 90th with about 900,000 viewers aged 18 to 49.

Cable networks keep such shows on the air, hoping viewers will eventually find them on demand or in a Netflix afterlife; others renew duds because they fear blowback from viewers who've invested in the characters.

But cracks are starting to show. In 2000, 10 percent of original series were canceled. Today, more than half are not picked up for another season, says Liam Boluk, a media strategy consultant at newsletter Redef. AMC canceled cop drama *Low Winter Sun* in 2013 after one season. Even **TNT**'s *Mob City*, written and directed by *Walking Dead* creator Frank Darabont, wasn't renewed for a second season in 2014. Says Boluk: "Original programming has never been more important for TV networks, but it's also more costly and failure-prone than at any time in television's history." —*Gerry Smith*

The bottom line An hour of scripted TV typically costs $3 million, but one *Game of Thrones* episode ran $8 million.

Autos

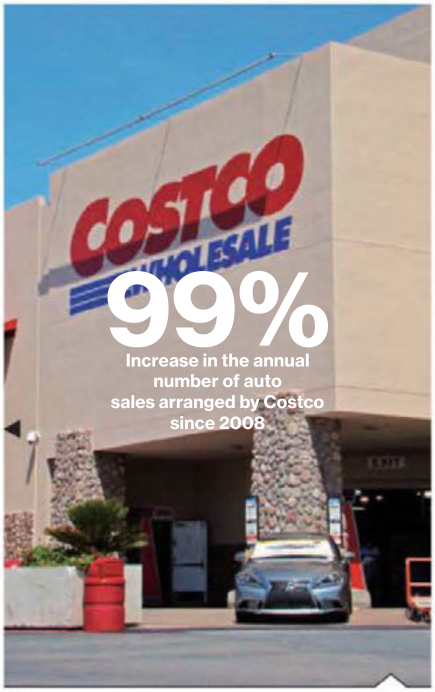
The SUVs Are in Aisle 7, Past the Olive Oil

▶ Costco's warehouse clubs have become big sellers of cars

▶ People want a deal, but "they don't want all the headaches of haggling"

Ron Schurter didn't bother visiting a dealer when he was in the market for a new car. He hit his local Costco. There was no haggling. Or upselling. There was just the price the warehouse retailer offers its members: about $39,000 for a 2015 Toyota Highlander, $4,000 less than the manufacturer's recommended price. Schurter signed the contract and picked up his SUV from ▶

WILSON: FOCUS ON SPORTS/GETTY IMAGES; ALLEN: COURTESY KEVIN A. KOSKI/NFLPA; *PROJECTION; FIGURES INCLUDE SERIES WHOSE FINAL SEASONS WERE PLANNED; DATA: REDEF



99%
Increase in the annual number of auto sales arranged by Costco since 2008

◀ a Toyota showroom. "I've been telling everybody," says the 75-year-old retiree from Yorba Linda, Calif. "I probably won't shop anywhere else."

Last year, **Costco Wholesale** moved almost 400,000 vehicles of all major brands in the U.S., twice as many as in 2008. Without fanfare, the membership-only merchant better known for selling flatscreen TVs and jumbo-size boxes of cereal has pulled within spitting distance of No. 1 car retailer **AutoNation,** which sold 533,000 vehicles last year. "That's a much bigger number than I would have expected," says LMC Automotive analyst Jeff Schuster. "This reinforces that everybody wants a deal, but they don't want all the headaches of haggling."

Costco is tapping America's growing wariness with car dealers. Dozens of services such as **TrueCar** have sprung up to improve the auto shopping experience by offering price transparency, one-stop comparisons of multiple brands and models, and even help with negotiating. At the end of 2014, 65 percent of new-car buyers reported using such services, up from 40 percent in 2008, says J.D. Power.

Costco doesn't sell cars per se. Working through an auto-buying service called **Affinity Auto Group**, the $112.6 billion retailer uses its purchasing power to negotiate discounts for its more than 45 million U.S. cardholders. Costco's huge scale gives it the clout to insist that local auto partners that sell through Affinity beat rivals' prices. Ken Ryan, who runs a GMC dealership on Long Island, says Costco's tough negotiations mean buyers save as much as $1,000 per vehicle. The retailer fields a team of mystery shoppers to make sure dealers stick to the agreed price.

Last October, Costco and **General Motors** offered U.S. buyers a $500 store gift card plus a non-negotiable price for most GM models. In the fourth quarter of last year, GM sold 43,300 vehicles through Costco, or about 6 percent of the automaker's total domestic sales in that period. The Costco promotion helped GM attract buyers in California and Western and Southern states, where foreign brands are more popular.

Costco makes no money on the auto sales. It offers discounted vehicles to attract members and keep existing ones paying the club's $55 annual fee. "Their primary, overwhelming interest is members' willingness to join and renew," says John Rand, senior vice president for retail insights at Kantar Retail. "The filter by which they do anything is, 'What do my members think?' "

Eight years ago, it was sometimes difficult for Costco to get carmakers' attention for national promotions, says Gina Paolino, president of the Costco Auto Program. Today, automakers are coming to them, and there's a waiting list of dealers keen to participate at almost every Costco warehouse. "Now we have a story," Paolino says. "We're getting more interest because of the success." *—Jeff Green and Jing Cao*

The bottom line More than 398,000 vehicles were sold through Costco's warehouse stores last year vs. more than 199,000 in 2008.

Online

Startups See Dollars in China's Young and Lonely

▶ Cultural pressure to marry spurs the growth of dating apps

▶ "Users are very willing to pay for a higher chance of succeeding"

Jack Zhai spends his evenings in Shenzhen swiping through photos of single women on **Tantan**, a mobile phone app that works like Tinder in the U.S. When he spots someone he fancies—women who he says show "spunk and character"—he clicks a heart-shaped button. The 25-year-old industrial designer, who moved to Shenzhen last July, then awaits responses to his chat requests. It's an easy way to make friends in a strange city, Zhai says, one that he hopes will end in a lasting relationship.

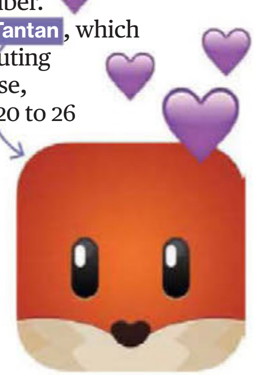
As China's worsening male-to-female ratio leads men of marrying age toward a demographic crisis, IResearch predicts online dating in China will generate about 10 billion yuan ($1.6 billion) in annual sales by the end of 2016, up 17 percent from 2014. While there have been doubts about the ability of U.S.-based makers of apps such as Tinder and Hinge to get customers to pay for relationship help, China's Internet entrepreneurs think they'll have an easier time.

"I don't think it's hard to make money from this at all," says Wang Yu, co-founder and chief executive officer of Tantan, who doesn't plan to charge until the year-old app has 10 million users, from 2 million now. Marriage is a cultural given across the mainland. "It's what the Chinese consider a 'rigid need' that they can't escape from," he says. "Users are very willing to pay for a higher chance of succeeding."

German media company **Bertelsmann**, an early investor in digital media provider Audible, which was later acquired by **Amazon.com**, pumped $5 million into Tantan this year. Early Apple backer **Sequoia Capital** and Vertex Venture Holdings, a unit of Singapore sovereign wealth fund **Temasek Holdings**, have invested $20.5 million in **Qingchifan**, another dating app.

The newbies are hoping to re-create the success of **Momo**, which has 69 million users and was China's most downloaded dating app in the first three months of 2015, according to TalkingData, which tracks mobile app usage. **Alibaba Group**-backed Momo raised $216 million from an initial public offering in December.

Beijing-based Tantan, which translates to "scouting around" in Chinese, targets users age 20 to 26 who typically are fresh out of college or about to graduate. In China, such young people often move to a new city for their



first jobs and must establish local social contacts from scratch. The dating service plans eventually to charge users for ways to make their profiles more prominent.

Qingchifan, which means “my treat” and lets its 10 million registered users offer one-on-one lunch or dinner invitations, is a step ahead. Members who pay to post their invites—fees normally range from 5 yuan to 180 yuan—get them posted with an icon that displays a score for the potential dinner host’s “reliability” to show up for the date, based in part on how much they paid for the listing, says the app’s founder, Liu Gangqiang. The average age of male users is 26; for females it’s 23, Liu says.

Because of the Chinese one-child policy and a traditional preference for sons, there will be more than six potential grooms in China for every five unmarried women by 2050, says the United Nations Population Fund. By then the proportion of single men at age 50 would increase to 11 percent, from 3 percent in 2012.

“There are many more men than women and a lower chance for men to find a suitable partner,” says Gloria Chan, a professor at City University of Hong Kong who studies youth behavior. “If you add the longer hours Chinese work these days, it leaves even less time for social interaction.”

Tantan CEO Wang, a Swedish-trained engineer who previously worked for Ericsson in Stockholm, expects more users to think like Zhai, who says he’d consider paying as much as 5 yuan a month if the app began charging. Although modest, such a fee could potentially yield 50 million yuan in monthly revenue if Tantan hits its target of 10 million users, Wang says.

Still, relationship sites have natural limits. When they succeed in helping members hook up, their usage either drops or members cancel their subscriptions altogether, says Michelle Ma, a Bloomberg Intelligence analyst in Hong Kong. “The industry has been growing over the years, but they will not grow as big as other social networking areas,” she says. “The limitation is that people will leave after they find their partners.” —*Liza Lin*

The bottom line In China, the success of Momo, a dating site with 69 million members, is attracting rivals.

Edited by James E. Ellis
Bloomberg.com

FROM TOP LEFT: COURTESY COSTCO AUTO PROGRAM; GETTY IMAGES; ALESSIA PIERDOMENICO/BLOOMBERG

Briefs

By Kyle Stock

Regime Change in FIFA

FIFA President Sepp Blatter took himself out of the game, announcing his resignation days after 14 of the soccer organization’s officials were indicted for a range of fraud charges by U.S. authorities. Blatter, who wasn’t indicted, won reelection on May 29, but pressure on him mounted from corporate sponsors including *Anheuser-Busch InBev*, *Coca-Cola*, *McDonald’s*, and *Visa*. FIFA collected $1.6 billion in sponsorship cash between 2010 and 2014 World Cup tournaments. U.S. car sales in May zoomed to their fastest pace in almost a decade, fueled by a robust labor market, low interest rates, and relatively cheap gas. Trucks and SUVs posted the biggest gains. *Fiat Chrysler Automobiles*’ Jeep brand was particularly coveted, posting a 13 percent increase in unit sales. *Fitbit* is getting in shape for Wall Street, saying it will seek to raise up to $478 million in an initial public offering. The fitness device maker reported a $100 million profit on $745 million in sales last year but faces an increasingly crowded field. *Toys “R” Us* named David Brandon, the former boss at *Domino’s Pizza*, as chief executive officer. While Brandon has little retail experience, he has a track record of taking companies public. The toy retailer hasn’t been on Wall Street since three private equity firms bought it in 2005. Most recently, Brandon was athletic director of the University of Michigan. *Pinterest* said it would add a “Buy It” button to its pinned Web pages later this month. The five-year-old startup, valued by investors at $11 billion, had been slow to build an e-commerce engine. *Facebook*’s Instagram also is testing an ad template that will include purchase links.

Ousted **Men’s Wearhouse** founder George Zimmer launched a network of on-demand tailors. Dubbed **zTailors**, the startup has 600 tailors who can be summoned via an Uber-like app.

The estimated annual amount **JPMorgan Chase** said it would save from canceling voice mail for the majority of workers in its consumer banking division.	**$3.2m**

CEO Wisdom

“Our story is one of an airline that has chosen to challenge the global status quo, bringing new competition.”

Etihad Airways CEO **James Hogan**, refuting claims by U.S. carriers that Abu Dhabi unfairly subsidizes Etihad

How to Make Friends And Influence Elections

Jordan at his Sonoma Valley estate

▶ This California winemaker has a private plane and a boat. Now he has a super PAC, too

▶ "I'm not the sort of country club Republican that is just happy to write a check and be done"

John Jordan, who runs his family's award-winning Jordan Winery in Sonoma County, Calif., has a lot of stuff. There's the 1,200-acre estate his parents bought in 1972 and its 58,000-square-foot chateau. He has a bass fishing boat, which he keeps docked on one of two man-made lakes on the property, and three private planes, one of which he keeps parked near the estate so he can fly to nearby Santa Rosa for sushi. He has a startup, which has developed an app for restaurant wine lists, and a marketing team that makes videos of Jordan and his staff dancing to pop songs like *Gangnam Style* and *Blurred Lines* to post on the company website.

Before the midterm elections Jordan, a longtime Republican political donor, decided he wanted something else, too: his own political operation. In October he set up Bold Agenda PAC and spent almost $573,000 promoting an 11-point policy agenda modeled on the 1994 Contract with America. It included rolling back taxes for small businesses that introduce employee profit-sharing and cutting the salaries of elected officials. Jordan poured some of the cash into running ads for Elan Carr, a Republican who lost his bid for the Los Angeles-area House seat vacated by longtime Democratic Representative Henry Waxman.

Jordan paid for polling data as well as ad-making and media-buying advice, but rather than hire political operatives to make decisions, he did the grunt work of drafting scripts and reading poll numbers himself. "By nature I'm a hands-on guy," says Jordan, 43. "I'm not the sort of country club Republican that is just happy to write a check and be done with it."

Jordan, who was one of the top 25 individual donors to super PACs in 2014, according to the Center for Responsive Politics, represents a new breed of political funder created by the Supreme Court's 2010 *Citizens United* decision. Rather than signing over contributions to a candidate's campaign or to a super PAC, rich political enthusiasts such as Jordan can run their own minipolitical operations with almost no limits. "On some level, it's showing the system works," says ▶

YOUTUBE

Jordan's Super PAC Spending

$572,900
Bold Agenda PAC

$1.7m
Americans for Progressive Action

$637,500
New Republican PAC

DATA: 2013-14, FEDERAL ELECTION COMMISSION

◀ Neil Reiff, the former deputy general counsel at the Democratic National Committee, now a partner at Sandler Reiff Lamb Rosenstein & Birkenstock in Washington. "Someone can just go out and do this on their own."

Starting a personal political operation gives Jordan a degree of control he wouldn't have as a donor to the influential network of super PACs and nonprofits run by the billionaire brothers Charles and David Koch, who've said they intend to spend $900 million supporting conservative candidates and causes in the 2016 elections. Financed through a combination of the brothers' wealth and donations from other contributors, the Koch groups have grown to rival traditional party organizations in size and scope. Top donors are rewarded with access to candidates at exclusive retreats, but they often have little say in setting policy demands.

Typically, solo donors have a particular issue in mind. California billionaire Tom Steyer, 2014's top super PAC spender, put up more than 90 percent of the $74 million his NextGen Climate Action Committee spent supporting Democratic candidates. The group's strategy was set by veteran Clinton operative Chris Lehane; many of its favored candidates, including Colorado Democratic Senator Mark Udall, lost.

Jordan, a lawyer who served in the Naval Reserve before taking over the winery business from his parents in 2005, has been a donor to Republican causes for years. In 2011, 2012, and 2013, he sent checks for the maximum amount allowed annually–more than $30,000–to the Republican National Committee. He gave generously in 2012 to Crossroads GPS, the nonprofit established by veteran George W. Bush aide Karl Rove to support Republican candidates. Its affiliated super PAC, American Crossroads, spent more than $100 million for Mitt Romney and Republican Senate candidates in several states, including Virginia and Ohio. "They lost," says Jordan, who soured on the idea of handing over cash without being able to track how it was going to be spent. "I don't think they think donors are stupid," Jordan says of political consultants. "But politics is a specialized game, and they don't want the donors actively involved for the most part."

In 2013 he quietly created his first super PAC, Americans for Progressive Action, to support Gabriel Gomez, a former Navy SEAL who ran against Democrat Ed Markey in Massachusetts to fill the U.S. Senate seat vacated by John Kerry when he became secretary of state. Jordan, who'd never met Gomez, dropped $1.7 million into the race after other Republican groups declined to get involved. "I will do the races that have some sort of outside shot, that maybe party committees and super PACs won't do because they're too risk-averse," Jordan says.

Gomez lost by 10 percentage points, but Jordan was just getting started. He set up a nonprofit policy advocacy group called Americans for Shared Prosperity and asked Rick Wilson, a well-known GOP ad man, to create a 60-second spot titled *Dating Profile*. In it, a woman in a pink shirt talks about falling out of love with the hunk she met in 2008. "I know I'm stuck with Barack for two more years, but I'm not stuck with his friends," she says. Jordan paid to air the ad nationally during the Sunday morning political shows, including *Meet the Press*. It drew more than 600,000 hits on YouTube. "Frankly, the system needs a shake-up every once in a while," says Wilson, who worked for Rudy Giuliani before setting up his own strategy company. "There are a million people making thousands of ads. He wants to do things that aren't dull."

Jordan, who declined to estimate his net worth, gave a total of $2.9 million to super PACs in 2013 and 2014. (Along with the two he started, Jordan gave $637,500 to New Republican PAC, a super PAC run by the GOP strategist Alex Castellanos to support a Republican U.S. Senate candidate in Oregon who lost.) He won't say how much he's put into the nonprofit Americans for Shared Prosperity, which isn't required to disclose its budget. And he won't predict how much he'll spend heading into the 2016 election. On June 22 he'll host a dinner at the Jordan Winery for Republican Wisconsin Governor Scott Walker, who hasn't yet announced his presidential candidacy.

An avid Denver Broncos fan, Jordan describes himself as a wedge buster. That's the guy a team sends down on a kickoff to run smack into a wall of opposing team players. The goal is to absorb their resources and give his teammates a chance to make the play. Winning isn't the way Jordan wants to measure the value of his political investments. "That isn't the issue," he says. "You've got to really be willing to, pardon the expression, geek out on this stuff." —*Phil Mattingly*

The bottom line A rich political donor disillusioned with large super PACs is spending millions through his own group.

Health Care

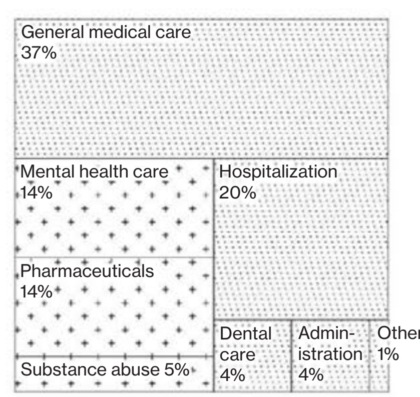
Obamacare Finds Fans In the Precinct House

▶ **Police and jail chiefs say expanding health coverage can reduce crime**

▶ **"I've got people who we're booking 150 times a year"**

Gary Herbert, Utah's Republican governor, has a health-care problem. Under the Affordable Care Act, states are eligible for federal money to pay for expanding access to Medicaid, the health insurance program for the poor. Herbert's spent more than a year pushing Utah's GOP-controlled legislature to accept the cash, but he's

Health-Care Costs in U.S. Prisons



DATA: PEW CHARITABLE TRUSTS

run into resistance from conservatives opposed to Obamacare. Lately he's gotten help making his case from an interest group not known for its liberal inclinations: cops.

Police chiefs and sheriffs who run local jails in states that haven't expanded Medicaid are coming out in favor of Obamacare on the grounds that it could help drug addicts and people with mental illness get help before they commit crimes. Thirty states have increased access to Medicaid. Broadening eligibility could extend coverage to about 3.7 million people in 20 states, according to estimates from the Kaiser Family Foundation. That includes 30,000 in Utah, about 1 percent of the state's population.

Jim Winder, the elected sheriff of Salt Lake County, says 15 percent to 18 percent of the 40,000 people booked each year into the county jail—Utah's largest—are severely mentally ill, about the same as the national rate. He spends $3 million to $5 million a year on psychotropic medication, out of a budget just shy of $90 million. Even if inmates have private insurance, the jail picks up the tab for them while they're locked up. It often takes days or weeks to stabilize them, and many are arrested again soon after release. "I've got people who we're booking 150 times a year," says Winder, a Democrat serving his third term. "If people think for a moment we're not paying for this, they are sadly mistaken."

In March, Utah's legislature passed a justice reform bill lowering the penalties for drug possession. The law contains provisions for putting addicts in treatment rather than in jail. Law enforcement leaders say that's a step in the right direction but worry that without additional funding—whether from federal Obamacare funds or some other source—there won't be enough space in rehab programs to accommodate the increased demand. "At the end of the day we will just have more crimes committed by people who are trying to fund their drug habits," says Chief Tom Ross of the Bountiful (Utah) police department, who hasn't taken a position on Medicaid expansion. He's president of the Utah Chiefs of Police Association, which has also stayed neutral on the Medicaid issue.

More than 350,000 people with serious mental illness are incarcerated, or about 16 percent of America's 2.1 million inmates, according to research by the Treatment Advocacy ▶

Campaign Swag **Tacky Sells**

In 2012, *Vogue*'s Anna Wintour persuaded President Obama's campaign to move beyond bumper stickers into designer goods and items like scented candles and tube socks, a top seller. The campaign took in $40 million from the stuff. Now the 2016 candidates are getting into sales, too.
—*Joshua Green*

Obama, 2012

Thakoon designed scarves, but not these socks

Hillary, 2016

100% cotton, and union-printed

The "Everyday Pantsuit" tee
$30
Hillary Clinton turns her old uniform into an inside joke

"Dude, that pantsuit tee! I hope they're making money."
—*Obama 2012 merchandise director Meaghan Burdick*

Most politicians would avoid flip-flops

Cross-stitched throw pillow
$55
"The perfect touch for any home," according to Clinton's website

Rick Santorum iPhone case
$45.95
His website urges fans to "get the gear, make a difference"

Hillary's "Hard Drive"
$99.95
Rand Paul made 80 fake e-mail servers. Now they're on clearance

Rand Paul sandals
$20
These let Paul fans "stand strong on the principles"

Also comes in blue

"Defeat the Clinton Machine" T-shirt
$19
Mike Huckabee offers a competing "everyday" tee

Coozie 6-pack
$20
Buy yourself a beer and let Ted Cruz keep it cold

15-inch Bernie Bear
$79.99
Vermont Teddy Bear offers Sanders fans "universal Bear Care"

Made with recycled stuffing

Ben Carson (R)
Lincoln Chafee (D)
Carly Fiorina (R)
Lindsey Graham (R)
Martin O'Malley (D)
George Pataki (R)
Marco Rubio (R)

WINE GLASS: COURTESY JORDAN WINERY; SHOPPING BASKET: NIKREATES/ALAMY

◀ Center. The group estimates that more than half of those shot and killed by police each year are mentally ill.

Gabriel Morgan, the sheriff of Newport News, Va., says improving mental health care became a priority for him after a deputy was assaulted by an unstable inmate in 2007. The deputy lost an eye and wound up with five titanium plates in his face. The department frequently responds to mental health crises, including some people who aren't accused of crimes. In a recent week, Morgan says, officers took custody of 14 people who had to be involuntarily committed, in a city of 188,000. Morgan supported Virginia Democratic Governor Terry McAuliffe's plan to expand Medicaid, which Republicans scuttled earlier this year. "We are arresting too many people who would never have committed a crime if they had gotten help," says Morgan. "The question is, do we go upstream? Or do we go downstream and wait for the bodies to come down?"

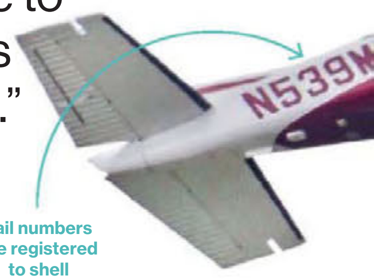
Salt Lake County Sheriff Winder says lawmakers he talks to in Utah appreciate the adverse social effects of making it difficult for the poor and indigent to get medical care, but that doesn't stop partisanship from getting in the way. "People's eyes glaze over, and they just say one word: Obamacare," says Winder. "After that, you may as well be talking to a pig about Christmas. It's not going anywhere." —*John Tozzi*

The bottom line Some cops support expanding Medicaid to cut crime by increasing access to mental health care and addiction treatment.

Quoted

"We must make darn sure that safeguards are in place to protect the civil liberties of innocent Americans."

Senator **Chuck Grassley** to the Associated Press, which reported on June 2 that the FBI has a fleet of surveillance aircraft that fly over U.S. cities with technology that tracks cell phone users



Tail numbers are registered to shell companies

Welfare

Squeezing the Poor At the ATM

▶ **Kansas puts a $25 withdrawal limit on public-assistance cash cards**

▶ **"This is a solution seeking a problem"**

Kansas is in trouble. After slashing income taxes in 2012, the state faces a revenue gap of more than $400 million. Republican Governor Sam Brownback and state legislators are debating how to make up the shortfall. So far they've agreed on one way to control how state money is spent. Starting in July, people on the dole will be limited to a single ATM withdrawal of no more than $25 per day. The law also prohibits spending public-assistance cash at movie theaters, swimming pools, and video arcades. Nail salons and tattoo parlors are out, too.

"The primary focus is to get people back to work, because that's where the real benefit is–getting people off public assistance and back into the marketplace with the dignity and far more income there than the pittance that government gives them," Brownback said when he signed the Kansas bill into law in April.

Kansas is among several Republican-controlled states that have recently cut or limited public-assistance funds. In Arizona, which faces a $1 billion budget shortfall, lawmakers voted on May 18 to limit welfare to a year, the shortest window in the nation. On May 5, Missouri's Republican legislature overrode Democratic Governor Jay Nixon's veto to enact a bill that cut thousands of low-income families from aid rolls by reducing how long people can claim cash from five years to fewer than four. Michigan's GOP-controlled legislature passed a bill on June 2 that strips cash assistance from families with chronically truant children. "During the recession there were lots of blue states, for fiscally driven reasons, that were cutting welfare," says Liz Schott, a senior fellow at the liberal Center on Budget and Policy Priorities, a Washington think tank. "This year's cuts feel more ideologically driven."

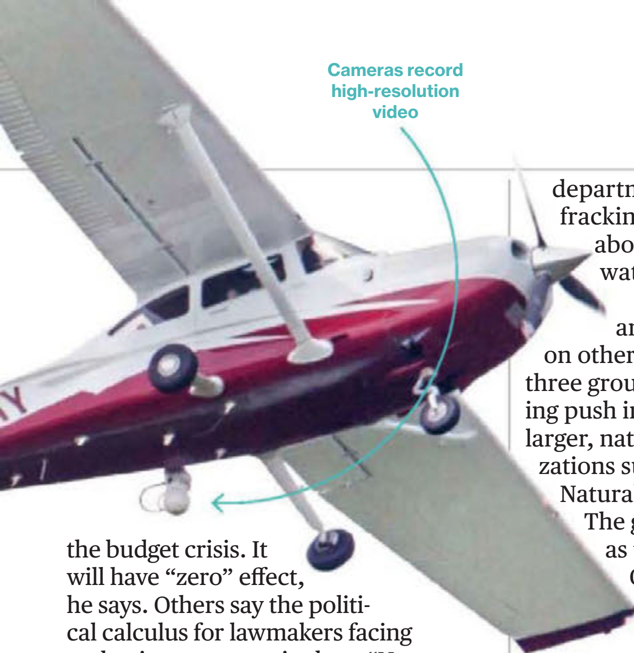
A September 2014 survey by the Pew Research Center found that 73 percent of Republicans feel the government can't afford to do much more to help the needy, compared with 32 percent of Democrats. "If you look at cycles in history, you'll see that there is compassion, then compassion fatigue, and then blame," says Patricia Baker, a senior policy analyst at the Massachusetts Law Reform Institute, a Boston nonprofit that researches poverty. "This happens because there's impatience with the solution."

The number of families receiving cash through Temporary Assistance for Needy Families (TANF), the federal-state aid program that grew out of the 1996 federal welfare reform law, peaked in 1994 at 5.1 million families, according to the Congressional Research Service. It's since plummeted to 1.5 million at the end of 2014. In Kansas 6,478 families were on welfare at the end of last year, down from 7,553 in 2013. Monthly payments for a family of three range from $386 to $429, depending on a county's population and cost of living.

The restrictions on ATM withdrawals could eat up as much as 10 percent of that in transaction fees, according to Shannon Cotsoradis, president and chief executive officer of the advocacy group Kansas Action for Children. She says state lawmakers acted on anecdotes about TANF cards being used at casinos and, in one instance, on a cruise ship. "This is not a data-driven policy decision," she says. "This is a solution seeking a problem."

"The primary focus is to get people back to work, because that's where the real benefit is." —*Kansas Governor Brownback*

Duane Goossen, a former Republican state lawmaker who served 12 years as Kansas's budget director under governors of both parties before leaving the post in 2010, says the restrictions won't do anything to help fix

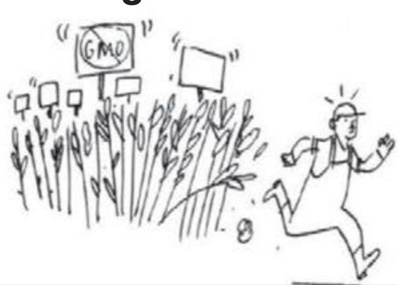


the budget crisis. It will have "zero" effect, he says. Others say the political calculus for lawmakers facing reelection next year is clear. "Now they can go home and say they made it really tough on" the poor, says Burdett Loomis, a professor of political science at the University of Kansas. "No more free ride, blah-blah-blah." *—Tim Jones*

The bottom line Kansas, like other Republican-led states, is adding restrictions on welfare benefits.

Environment

Activists Move From Fracking to GMOs



▶ They are pushing for food-labeling laws in New York

▶ "If they don't have a boogeyman out there, they cease to exist"

Energized by a victory against oil and gas companies in New York state, environmental groups have set their sights on sellers of genetically modified organisms. Food & Water Watch, the New York Public Interest Research Group, and Catskill Mountainkeeper were part of an alliance that in December beat back an attempt by **Chesapeake Energy** and other companies to persuade New York Governor Andrew Cuomo to allow hydraulic fracturing. The governor, following the advice of the state health department, announced a ban on fracking, saying too little is known about how the drilling affects the water supply.

With that fight behind them and with more time to focus on other issues, members of the three groups have joined a GMO labeling push in the state, working alongside larger, national environmental organizations such as the Sierra Club and the Natural Resources Defense Council. The groups are known collectively as the New York GMO Labeling Coalition, formed by the advocacy group GMO Free NY in 2013. The coalition's goal is to pass legislation first introduced two years ago that requires food distributed in New York to carry a label if it contains GMOs.

"Since the fracking decision, our capacity was freed up," says Alex Beauchamp, Northeast region director of Washington-based Food & Water Watch. His group and some of the others behind the fracking ban victory got involved in the fight against GMOs in 2013. The issues, Beauchamp says, are closely aligned—both deal with protecting land and water from chemicals.

Thanks to recent efforts by the coalition, a GMO labeling bill is advancing through the state assembly, according to Assemblywoman Linda Rosenthal, a Manhattan Democrat and the legislation's lead backer. It has at least 70 sponsors in the 150-member chamber, she says.

Environmentalists say GMOs reduce crop diversity and boost the use of chemicals to eradicate weeds and pests. The public has a right to know when GMOs are used in food, they say. Manufacturers and farmers opposed to the labeling say it will increase food costs, in part because it will require new warehousing methods for GMO-labeled products because they'd have to be separated from other items for distribution. In their view, the labeling movement is an attempt by organic farmers to increase their market share.

The activists "have to have a cause to sustain their business model," says Rick Zimmerman, an Albany lobbyist who represents farmers and companies opposed to the coalition. "If they don't have a boogeyman out there, they cease to exist, and GMOs are an attractive issue from their standpoint."

If New York, home to 19.5 million residents, approves the GMO labeling bill, it could set off a chain reaction with other states in the region. Connecticut and Maine passed GMO labeling laws in 2013, but those take effect only when states in the Northeast with a combined population of at least 20 million are covered by similar laws. A labeling law goes into effect in Vermont in July 2016.

Companies including **Monsanto**, **Dow Chemical**, and **Syngenta** splice DNA in seeds so that corn, soybeans, beets, and other produce can survive droughts, weed killers, and various growing hazards. Since 2012, GMO labeling opponents have spent more than $68 million to defeat ballot measures in California, Washington state, and Oregon.

$68m

Amount that GMO labeling foes have spent to defeat ballot measures since 2012

In New York, where the fight will take place in the legislature rather than at the ballot box, Big Agriculture is facing a well-entrenched foe in at least one member of the coalition. Food & Water Watch, which advocates for clean and healthy food and water, expanded its presence in the state after 2008, when then-Governor David Paterson said he wouldn't allow fracking for natural gas until its effects were more carefully studied. The environmental group led campaigns to inform residents of what they said were the dangers of fracking. That gave rise to dozens of local organizations that have since embraced new causes, including GMO labeling and formaldehyde-free toy manufacturing.

"We'll win by having people active and in the streets," Beauchamp says of the group's latest target. "The GMO campaign will play out the same as fracking, with a sustained grass-roots effort."

Steve Ammerman, a spokesman for the New York Farm Bureau, a lobbying group that represents more than 28,000 New York farm families, says farmers must highlight how modified seeds reduce pesticide use and increase crops per acre, which can help feed a fast-growing world population. "We have to do better jobs of getting out there and telling that story," he says. *—Freeman Klopott*

The bottom line If New York approves a GMO labeling bill, similar laws in Connecticut and Maine could take effect.

Edited by Allison Hoffman
Bloomberg.com

FROM TOP: ANDREW HARNIK/AP PHOTO; ILLUSTRATION BY GRAHAM ROUMIEU

June 8 — June 14, 2015

A Swift Takeoff

▶ Developers and academics are embracing Apple's new programming language

▶ "The response was crazy for Swift. That's all the people want"

Ask the average **Apple** fan to list the company's important announcements of last year, and she'd probably start with the Apple Watch and bigger iPhones. Ask Apple developers, and they're almost certain to mention Swift, the computer language unveiled at Apple's Worldwide Developers Conference last year.

Developers at the conference applauded as Craig Federighi, Apple's senior vice president for software engineering, ran through new features with names like type inference, closures, and multiple name spaces. "You know how many people at home are going, 'What in the heck are these guys talking about?' " he joked from the stage.

Since Swift's release last June, its growth has been "essentially unprecedented," says a report published in January by RedMonk, an analytics firm for developers that ranks programming languages. In just seven months, it rose to No. 22 on its top-100 list. A survey in February of more than 26,000 developers by Stack Overflow, a question-and-answer website for coders, named Swift the world's most loved computer-programming language.

Universities including Stanford have embraced the language and created online courses to teach it, as have websites that offer lessons in programming. Ray Wenderlich, a Web developer who runs a popular tutorial website, RayWenderlich.com, says he immediately shifted his focus almost entirely to the language. "The response was crazy for Swift," he says. "That's all the people want."

Apple dictates which languages developers must use to create apps for its mobile devices. There's a financial incentive to develop for Apple—the average Apple user generates four times as much revenue for developers as the average Android user, according to Benedict Evans, an industry analyst with Andreessen Horowitz.

Before Swift, the only choice for Apple developers was Objective-C, a language created in the 1980s. Decades later, developers say, Objective-C feels dated. Critics use words like "verbose," "old-fashioned," and "ugly" to describe it. But the older language also has fans. When asked whether Objective-C is difficult to code in, Peter Morelli, vice president for engineering at ride-sharing service Lyft, says, "I think that's kind of a religious war. Many people are very productive in it." Apple declined to comment for this story.

Swift gets good marks for safety—how resistant it is to coders inadvertently adding bugs—and for keeping up with trends in programming. Another plus singled out by its fans is expressiveness, meaning how easily a developer can explain what he or she wants to do in code.

Developers say that by using Swift they can get the same results with fewer lines of code than with Objective-C. "If you looked at all the squiggly lines and semicolons, Objective-C would have four times as much," says Myers Carpenter, a developer for Treehouse, a company that offers online courses on coding.

After Lyft asked one of its engineers to experiment with Swift about six months ago, the company decided to rewrite its app using the language, reducing the number of lines of code by a factor of five. The app will be released in July. Morelli says coding in Swift takes substantially less time than with Objective-C. "Going from months to days is pretty nice," he says.

Another Swift early adopter is content-sharing platform SlideShare, which LinkedIn bought in 2012. SlideShare developers used the language to create an app that allows users to browse and share corporate presentations, videos, and infographics.

The language works well, but there are glitches, SlideShare's coders say. One issue: The program that converts Swift into a computer-readable format uses so much processing power that it overwhelms the 13-inch versions of MacBook Pro laptops. "My co-workers who have 15-inch models with quad-core i7s have a much better time," Kyle Sherman, a software engineer for LinkedIn, wrote on the company's engineering blog. "Either way, the fans are quite loud when compiling."

Growing pains are fairly routine with a new language. Apple will continue to tweak Swift, though there will be fewer big changes over time. Still, the current pace of change makes the language unstable; code written in one version will have to be modified to work in the next. Colin Eberhardt, technology director for Scott Logic, a software development company, is a fan of Swift but says Apple's updates regularly break his code. "You just don't want to be using Swift," he says, for the final version ▶

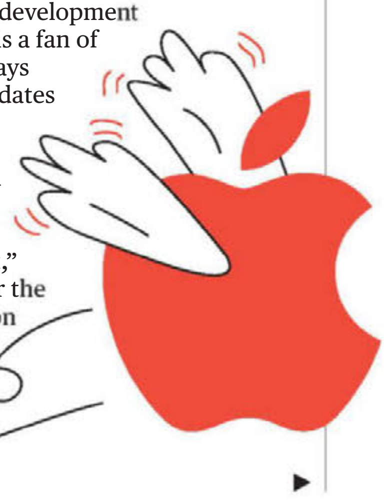


ILLUSTRATION BY 731

◀ of your code. Better to wait until the language matures.

There's still far more programming being done in Objective-C than in Swift, but the new language's success could eventually mean the death of its predecessor—if Apple decides it doesn't want to support two languages. For now, the company has told developers they can continue using Objective-C. Web developer Wenderlich says Swift's dominance is probably years away, but it will happen. "Then people will start to migrate to Swift," he says, "and eventually Objective-C will go away."
—*Joshua Brustein*

The bottom line Less than a year after its release, Swift is No. 22 in a ranking of the world's most popular programming languages.

Games

Nintendo Tries to Get Back in the Game

▶ The company has revived a long-abandoned gaming competition

▶ "The environment has dramatically matured"

On the last Saturday in May, the temperature in New York City was approaching 85 degrees by 10 a.m. and the humidity was high. Clifford Barnes, first in line for a qualifying round of the Nintendo World Championships at a Best Buy store in Queens, N.Y., was reevaluating his decision to spend 14 hours waiting in line to participate. He looked weary as he was ushered into the store. Maybe staying up all night wasn't the best way to prepare for an activity that relied on mental and manual dexterity.

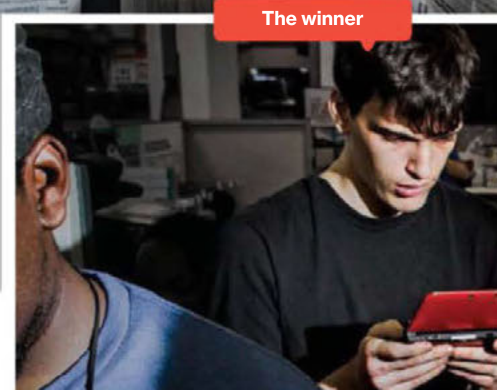
Three weeks earlier, **Nintendo** had announced plans for the second incarnation of the World Championships, the finals of which are scheduled to take place in late June at the E3 Expo in Los Angeles, one of the biggest gaming events in the country. Nintendo held its first contest in 1990—when Barnes was 8—as a way to drum up enthusiasm for its games. Back then, the Kyoto-based company was early—maybe too early—to competitive gaming, now known as e-sports. It soon lost interest, well before gaming events really took off in the mid-2000s. Nintendo declined to comment for this article.

The Queens event was one of eight qualifiers held across the country. At each location, contestants played a combination of Super Mario Bros., Super Mario Bros. 3, and Dr. Mario. A single winner was chosen at each store. Nintendo will fly all eight players to Los Angeles for the June 14 finale.

More than 134 million people watch

Thumb warriors

The winner



PHOTOGRAPHS BY DINA LITOVSKY FOR BLOOMBERG BUSINESSWEEK

▲▲ Fans lined up at a Best Buy in New York City to qualify for the Nintendo World Championships

▲ Many players wore clothing copied from Nintendo games, like the squid from Splatoon

◀ Players were packed into a roped-off area to compete in a game called NES Remix

◀ John Goldberg recorded the high score of 4.7 million

video game competitions, which bring in $600 million globally in annual revenue, according to gaming research firm SuperData. "The environment has dramatically matured in such a way that Nintendo has said, 'OK, we need to actually do something here,' " says Sundance DiGiovanni, the chief executive officer of Major League Gaming, a professional e-sports organization. "It's happening slowly over the last couple of years."

Nintendo's Super Smash Bros. has been popular among competitive gamers. But when Evo, a long-running gaming tournament in Las Vegas, included Super Smash Bros. on its roster in 2013, Nintendo told the organizers they couldn't stream the competition online. It reversed its decision after a backlash from gamers, eventually signing on as an Evo sponsor the following year. "Nintendo didn't have a priority on competitive gaming, and so they'd just be very closed off to what we wanted to do," says Evo co-founder Tom Cannon. "Now it's the opposite."

Championships for games such as League of Legends and Call of Duty take place in leagues or tournaments that players and fans take as seriously as professional sports. But Nintendo's qualifier in Queens was more of a lark. Players were ushered into a cordoned-off section of the store in groups of 15. Each had one shot—lasting about six minutes—at Nintendo's NES Remix, a combination of Super Mario games. The player with the highest score would move on to the finals.

Nintendo had said that only the first 750 people to arrive could compete. A block-long line stretched out by the time the doors finally opened. Young men furiously tapped out some last-second practice sessions on their portable Nintendo consoles. Some parents quietly coached their children. One competitor recorded everything from a GoPro camera strapped to his forehead.

But the early excitement fizzled. The Queens event ultimately drew only about 250 entrants and petered out long before the official 7 p.m. finish. Nintendo employees spent the last few hours of the day milling around and trying to persuade random Best Buy customers to join in.

John Goldberg, a 23-year-old Queens native who describes himself as a competitive Smash Bros. player, felt his chances of winning were pretty good after his turn. "I did have a great run, but it could have been so much better," he said, while waiting for the other players to record their scores. He ended up taking first place and will go on to L.A. —*Joshua Brustein*

The bottom line Nintendo was once ahead of the pack on competitive gaming. Now it's playing catch-up.

Televisions

LG's Slim Screens Get Slimmer

▶ **The company is spending billions on high-end TV displays**

▶ **Focusing solely on LCDs means "the Chinese will eat you up"**

For **LG Display**, the world's largest maker of LCD screens, the future of television looks a lot thinner. The Korean company is betting big on screens powered by tiny organic light-emitting diodes, or OLEDs. Unlike LCDs, which rely on a separate light source behind the screen, OLEDs ▶

Thin and Thinner

TV sales	LCD	OLED
2013	210m	4k
2014	225m	77k
2015 (est.)	235m	600k
2016 (est.)	241m	1.5m

DATA: IHS, LG DISPLAY

◀ illuminate themselves, resulting in far slimmer and lighter displays. OLED TVs show deeper blacks and richer colors. "When you see one LCD and one OLED side by side, there's definitely a 120 percent difference," says Han Sang Beom, LG Display's chief executive officer.

TVs as thin as smartphones are now possible, Han says. His company has invested $3 billion since 2010 in facilities that make OLEDs. The first televisions with the new screens are 55-, 65-, and 77-inch models made by **LG Electronics**, part of the same corporate family as LG Display. The 55-inch model retails for about $5,499; a comparably sized high-end LCD TV from **Samsung Electronics** costs $1,998.

The OLED push by LG Display and LG Electronics is the latest attempt to get consumers to spend more on TVs. LG, Samsung, and rival TV makers started heavily promoting 3D televisions in 2010, but sales were tepid. With this latest technology, LG is on its own. Samsung is a leader in making smaller-sized OLEDs for mobile phones, which it uses in its Galaxy smartphone line and sells to Chinese handset makers. It has backed away from larger versions and is sticking with LCD for its televisions. Since LG Electronics is a distant No. 5 in smartphones, LG Display doesn't have the same in-house demand for small displays and has focused instead on larger OLEDs for TVs.

That's allowed LG Display to gain an edge over Samsung in the category. The companies disagree on the best material for the back of the display: LG uses a metal oxide while Samsung's engineers favor low-temperature polysilicon. Samsung's choice, which works well for mobile devices, has consistency problems in larger sizes, says Alberto Moel, senior research analyst in Hong Kong with Sanford C. Bernstein. LG's manufacturing process is more cost-effective, according to Moel. But the prices are still too high for most customers. "OLED has to be really price competitive to make people switch," he says.

LG Display has suffered "massive losses" in its OLED business, says Peter Yu, a BNP Paribas analyst in Seoul—about 1.2 trillion won ($1.1 billion) in 2014 and 2015 combined. LG declined to comment on its OLED results. Its LCD business more than compensated: Last year, LG Display had earnings of 917 billion won on sales of 26.5 trillion won. Yu expects profits to hit 1.6 trillion won this year.

LCD earnings are at risk as newcomers in China try to catch up to the Koreans. Beijing-based BOE Technology said on April 20 that it will spend 40 billion yuan ($6.45 billion) on an LCD factory that will produce displays for large TVs when it opens in 2018. "If you just stay with the LCD business, the Chinese will eat you up," Yu says. "You don't want to be in a business where the Chinese are building capacity."

LG Display expects to sell 600,000 OLED TVs this year and 1.5 million next year. Claire Kim, an analyst in Seoul with Daishin Securities, says more efficient manufacturing of OLED panels will help bring the price down. Han is trying to persuade other TV brands that he won't name to incorporate OLEDs. So far, some Chinese manufacturers have shown interest. Han says he's discussing the technology with Japanese companies. Interest from Samsung could help by popularizing the technology with consumers, even if the company won't buy from rival LG. "While we possess extensive technological capabilities with regards to OLED TVs, the commercial adoption of OLED TVs remains at an early stage and the market has not yet reached its full potential," Samsung said in a statement.

Television, Han says, is just the beginning for OLED display technology. Not having to include a backlight means engineers can do more than create ultrathin displays—they can use the screens in foldable and concave displays. "I'm thinking beyond the TV," he says.
—*Bruce Einhorn and Jungah Lee*

The bottom line LG Display has invested $3 billion in OLEDs since 2010 but has so far suffered big losses.

$5.5k

Cost of LG's 55-inch OLED television. A similar LCD model retails for $1,998

Materials

A Bay Area Startup Spins Lab-Grown Silk

▶ **It will use engineered threads to make high-performance fabric**

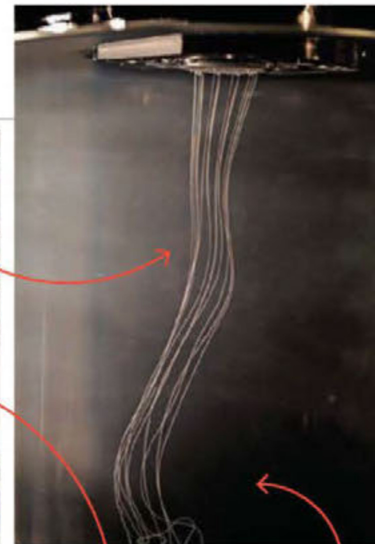
▶ **"What would have been done in cells of spiders" is made in the lab**

Five years ago, the graduate students behind a secretive startup called **Bolt Threads** set out to replicate the unique chemical properties of spider silk, an almost magically flexible and durable material that's in some ways as strong as steel. One of the first things they did was buy a batch of Nephila spiders—the common golden silk orb-weavers—from an insect dealer in Florida. Then they let the spiders spin their webs all over the company's first office at the University of California at San Francisco. One day a well-known UCSF molecular biologist walked in, saw a spider hanging in a doorway, and ran away screaming.

Scientists, at least those who aren't arachnophobes, have tried to mass-produce spider silk for decades with little success. Spiders are territorial and cannibalistic—try to farm them, and they end up eating each other. But scientists have long believed that if spiders would only cooperate, fabric made from their silk would be well-suited for use in military and medical equipment, like wound sutures or artificial tendons, as well as in high-performance athletic clothing and other garments.

Bolt Threads has ditched the live spiders but held on to this goal. The company has developed a synthetic alternative to spider silk by engineering proteins identical to the natural threads stretched across the nooks in your basement. It's raised $40 million from Silicon Valley venture capital firms **Foundation Capital**, **Formation 8**, and **Founders Fund** to commercialize its technology

ANDY LEVIN



Silk without spiders

Engineered silk fibers are excreted into a bath of water, salt, and sugar

A fermentation tank where silk-like proteins are made from yeast cells

The process replicates what a Nephila spider does when spinning a web

and turn those proteins into fabric. "Over the past few decades, as clothing companies squeezed on price, they've taken the innovation out of apparel," says Dan Widmaier, a graduate of the UCSF Ph.D. program in chemical biology and Bolt's chief executive officer.

Widmaier and co-founders Ethan Mirsky, Bolt's vice president for operations, and David Breslauer, its chief scientific officer, are genetically modifying yeast, single-cell organisms that convert simple carbohydrates to proteins through fermentation, and getting them to excrete silk-like proteins. "What would have been done in cells of spiders is now being done by yeast in our lab," Widmaier says.

Investors are betting this could revolutionize an apparel industry coasting on the decades-old invention of petroleum-based fibers such as polypropylene (lightweight and breathable but a breeding ground for stinky bacteria) and lycra (thin and stretchy, maybe too much so after repeated wear).

Bolt says that by slightly modifying the genetic makeup of yeast cells and tweaking the way it spins the secreted proteins into thread, it can engineer fabrics to specified levels of softness, durability, and strength. "Our investing hypothesis was to make tunable silk that is hyperelastic and machine-washable," says Steve Vassallo, a general partner at Foundation Capital, who discovered Widmaier and Breslauer during the summer of 2011, when they were in their spider-infested UCSF office.

Back then, Bolt Threads was called Refactored Materials and had scientific rather than commercial goals. Widmaier was studying how to make proteins from yeast cells when he met Breslauer, a Ph.D. student at UC Berkeley, who was looking at how to process spider silk into fibers. They were operating on grants from the U.S. Army and the National Science Foundation to research yeast-made proteins and evaluate uses in ballistics—possibly to replace Kevlar in bulletproof vests—and materials such as surgical sutures. The most lucrative opportunity was right in front of them; Widmaier's wife is a fashion designer at Old Navy, and the founders realized they could pitch their synthetic silk as an alternative to petroleum-based textiles such as polyester or cheap but non-eco-friendly staples like cotton.

Bolt Threads occupies offices across the San Francisco Bay, in Emeryville. A copy of *Charlotte's Web* is in the lobby, and a chandelier made of silkworm cocoons hangs in the conference room. The real action is in a series of interlinked labs, where billions of bioengineered yeast cells ferment, excreting their protein fibers into slurries of water, salt, and sugar. In another room, centrifuges filter out the silk from the liquid. A larger room will hold 200-liter fermentation units for producing silk in greater quantities. Bolt is working with manufacturing partners such as the Michigan Biotechnology Institute in Lansing, which will do larger-scale fermentation in 4,000-liter tanks using Bolt's process, and Unifi, a yarn manufacturer based in Greensboro, N.C., which will spin Bolt's fibers into apparel-ready yarn and textiles.

$40m

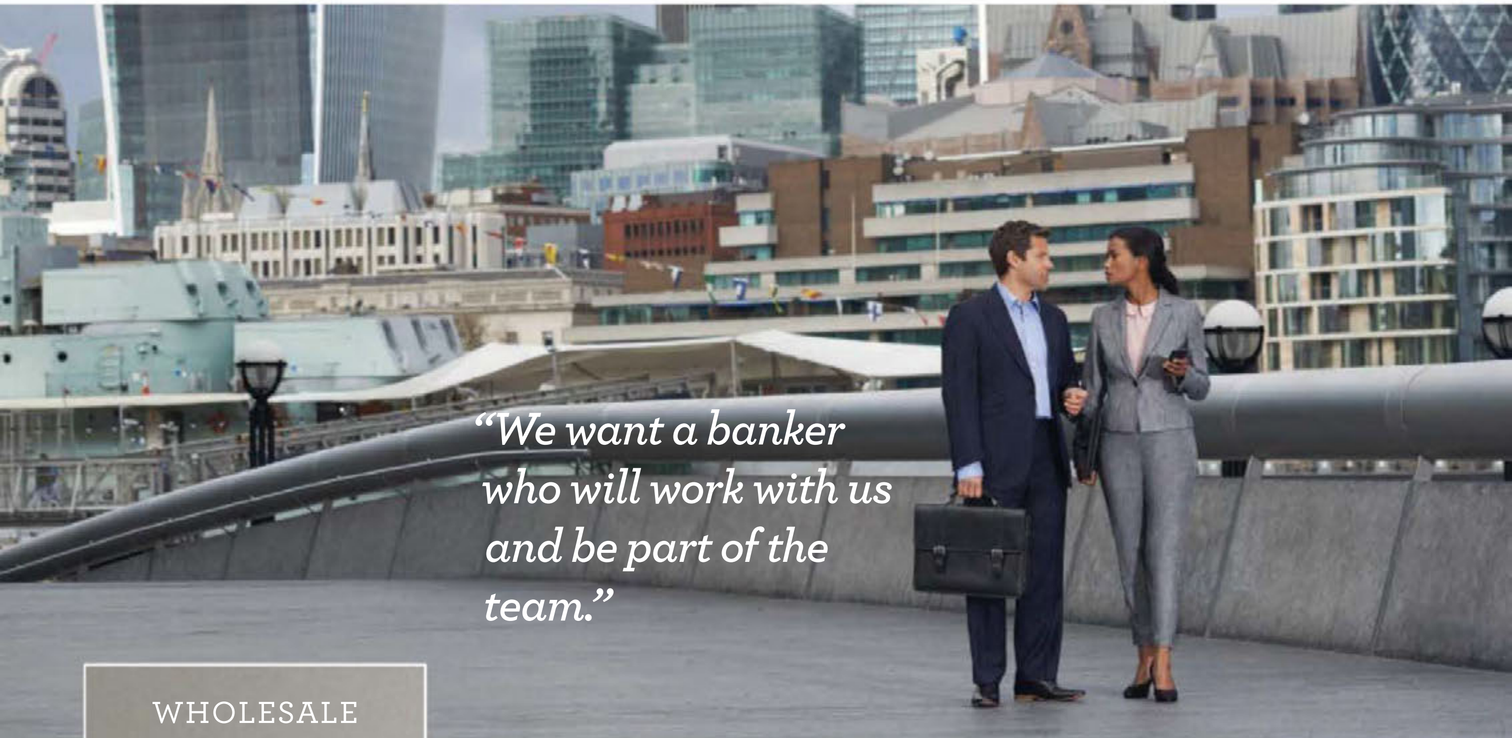
Venture capital raised by Bolt Threads since 2011

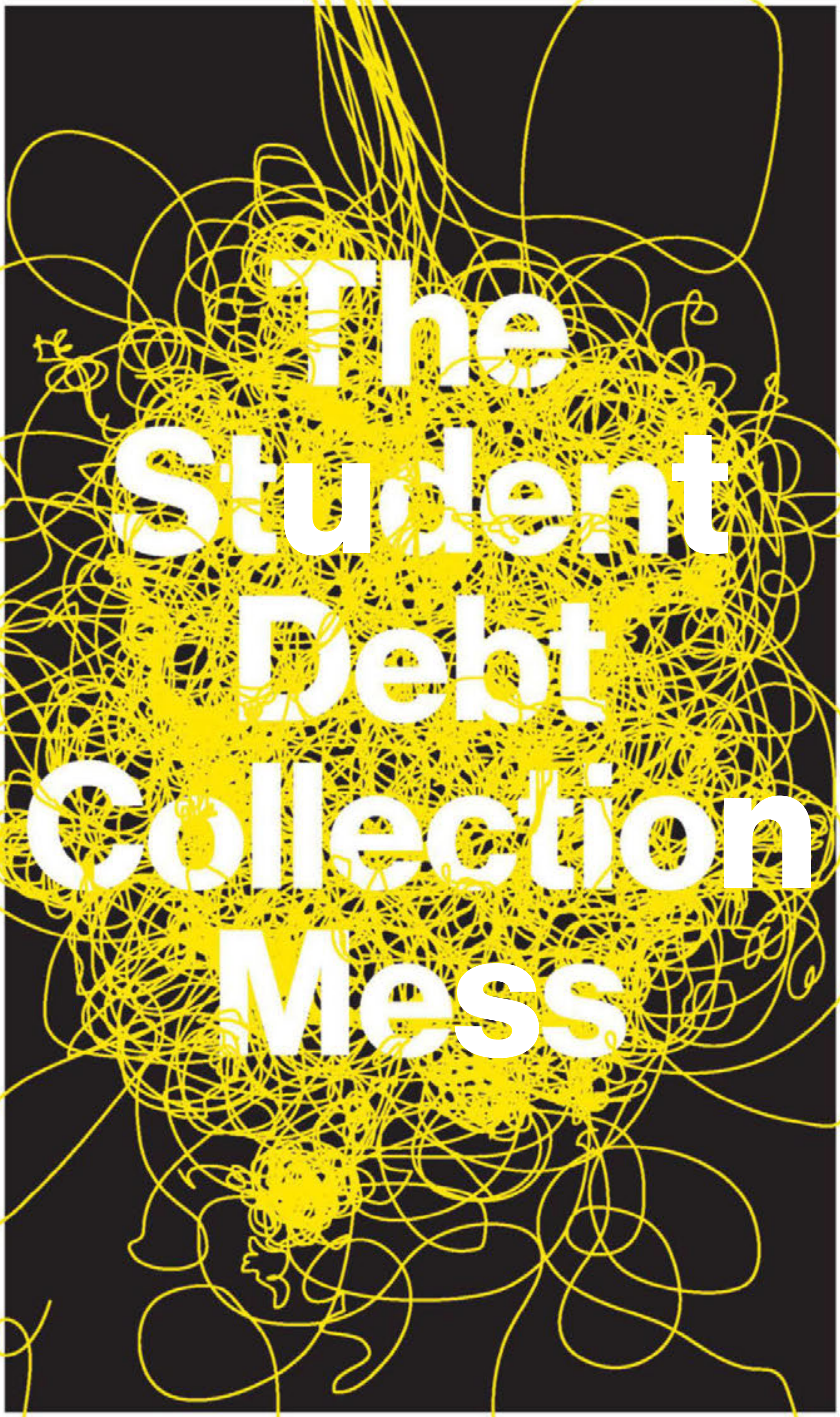
The company's aiming at the market for high-performance apparel such as sports shirts and bras and expects to have products by late next year. It hired Sue Levin, the founder and former CEO of athletic wear retailer Lucy Activewear, to lead merchandising and marketing.

Bolt Threads must decide whether it wants to make its own clothes or provide the fabric to other apparel makers, or both. The co-founders say they're talking to a major apparel brand about using the fabric Bolt will make but declined to disclose the company. There's plenty of competition: Rivals and researchers at Massachusetts Institute of Technology are studying bioengineered yeast for similar uses in apparel and medicine, like making artificial heart tissue. Bolt's fabrics may be expensive until the company can boost production over the next few years and drive down costs. "Almost all technology starts as a premium product," Widmaier says. At least there won't be spiders eating each other. —*Brad Stone*

The bottom line Bolt Threads expects products made with its yeast cell-based silk to be available in 2016.

Edited by Dimitra Kessenides
Bloomberg.com


"We want a banker
who will work with us
and be part of the
team."



The Student Debt Collection Mess

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▶ Lenders are suing without proof they own the loans

▶ "This is robosigning 2.0"

In 2003, Adam Beverly borrowed $30,000 from Bank One, now owned by **JPMorgan Chase**, to help cover the cost of attending Ohio State University. He never graduated. Three years later he found himself being sued by National Collegiate Student Loan Trust, which claimed he owed more than $45,000 with interest and penalties. After a two-year court struggle, Beverly prevailed. In September a panel of Ohio judges said the collector had no evidence that it owned the debt and vacated the judgment.

Student loans have eclipsed credit cards to become the second-largest source of outstanding debt in the U.S., after mortgages. Since 2007 the federal student loan balance has more than doubled, to almost $1.2 trillion from $516 billion. The Consumer Financial Protection Bureau estimates that students, former students, and their parents owe an additional $150 billion in loans from banks and other private lenders.

With defaults climbing, lenders have turned to the courts to collect. Many of their suits are marred by missing documents and procedural errors, say consumer advocates and lawyers defending debtors. "Our office is seeing an uptick in abusive loan debt-collection tactics that leave no room for relief," wrote Massachusetts Attorney General Maura Healey in an e-mail.

The paperwork problems echo the "robosigning" scandals that followed the housing bust. Like mortgages, student loans were bundled into packages and sold to investors. "This is robosigning 2.0 with student loans," says Robyn Smith, a lawyer with the National Consumer Law Center, a nonprofit advocacy group. "You have securitized loans in these large pools; you have the sloppy record keeping," as in the mortgage crisis.

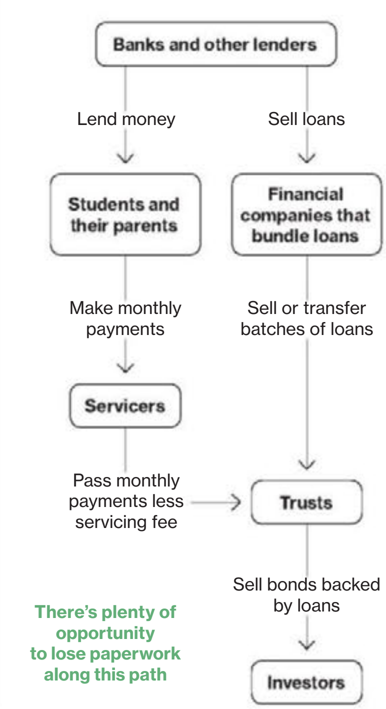
The National Collegiate Student Loan Trusts are investment vehicles created by a Boston company called **First Marblehead** that concentrates on education lending. From 1996 through 2007, First Marblehead bought student loans from lenders including **Bank of America**, JPMorgan, and a bank now owned by **Citizens Bank**. It transferred batches of loans to trusts it created—more than two dozen in all. ▶

◀ The trusts sold bonds backed by the loans. The trusts are responsible for collecting loan payments from borrowers and paying out interest to bondholders. In 2013 bond rater Moody's Investors Service said it expected losses to reach as high as 50 percent in 15 National Collegiate trusts it examined.

National Collegiate trusts have been among the most active in suing borrowers, consumer advocates say. Since 2011, National Collegiate has filed more than 1,900 civil cases in Missouri, or an average of more than one lawsuit a day. The company has filed a total of more than 2,100 suits in Connecticut, Indiana, Arizona, and Oklahoma, according to state legal databases. Representatives for National Collegiate didn't respond to repeated requests for comment. "We don't comment on the trusts," First Marblehead Chief Financial Officer Alan Breitman says.

Student debtors are challenging National Collegiate in court, and judges in Ohio, Florida, and Kentucky have found that the trusts haven't proved they own the debt. In California, 13 people are seeking class-action status for a suit against National Collegiate for suing them to collect on student loans without identifying the original lender—which violates California debt-collection law. National Collegiate has denied the allegations in court filings.

From Loan to Bond



"The cases that get filed in court for debt collection, a lot of times they are not for huge amounts, and so consumers may not show up to defend them"

Beverly's monthly payments jumped to more than $600 from about $120, says Greg Reichenbach, his lawyer. Beverly tried to discuss the payment but was bounced back and forth between First Marblehead and National Collegiate, Reichenbach says. He stopped making payments in 2009. In 2012, National Collegiate filed two lawsuits against Beverly in Ohio state court demanding repayment of the loans. Beverly says he initially turned for help with the lawsuit to a credit repair service, which told him it would take care of the problem. When Beverly didn't contest the suits, National Collegiate won default judgments.

The suits didn't assert that National Collegiate owned the loans, and after Beverly appealed, National Collegiate was unable to produce any documents indicating it owned them. "The whole basis for the lawsuit is that they are entitled to enforce this alleged debt, and they don't even claim that they were assigned the debt, let alone prove it," says Reichenbach, who handled Beverly's appeal. The same missing or incomplete records of loan transfers sank National Collegiate suits in Kentucky and Florida and has pushed the company to back away from lawsuits in New Hampshire, California, and Pennsylvania, say lawyers representing student borrowers.

Lenders and their representatives are overwhelming the courts with thin and sometimes inaccurate lawsuits, says Christopher Koegel, an assistant director at the Federal Trade Commission's Bureau of Consumer Protection. Often, as in Beverly's case, there's no trial. "The cases that get filed in court for debt collection, a lot of times they are not for huge amounts, and so consumers may not show up to defend them," Koegel says. When borrowers don't contest debt-collection lawsuits, judges automatically rule in favor of the creditor. Once a lender gets a judgment, it can begin garnishing a debtor's wages and seizing his personal property. "It may be burdening consumers with judgments over their head for years and years," Koegel says.

Pablo Ramirez learned the benefits of fighting back. Ramirez took out a $30,000 loan to pay for a bachelor's degree from Westwood College in 2006. When it came time to start paying off the debt, he says, the payments were more than he could afford. On a November morning in 2014, he went to his mailbox and pulled out a court notice that a judge had issued a judgment against him. He now owed $50,000 to National Collegiate. "I was in shock," Ramirez says, because he hadn't known he was being sued.

Ramirez contested the ruling. National Collegiate said it gave Ramirez notice of the lawsuit, but a Texas county court judge set aside the judgment. "They didn't have any facts right," Ramirez says. "It seemed like they were trying to throw anything against the wall to see if it stuck." —*Natalie Kitroeff*

The bottom line National Collegiate trusts have filed more than 4,000 lawsuits in five states seeking to collect on student loans.

Housing

Remaking Older Suburbs For Modern Tastes

▶ Mansions replace ranches for buyers seeking short commutes

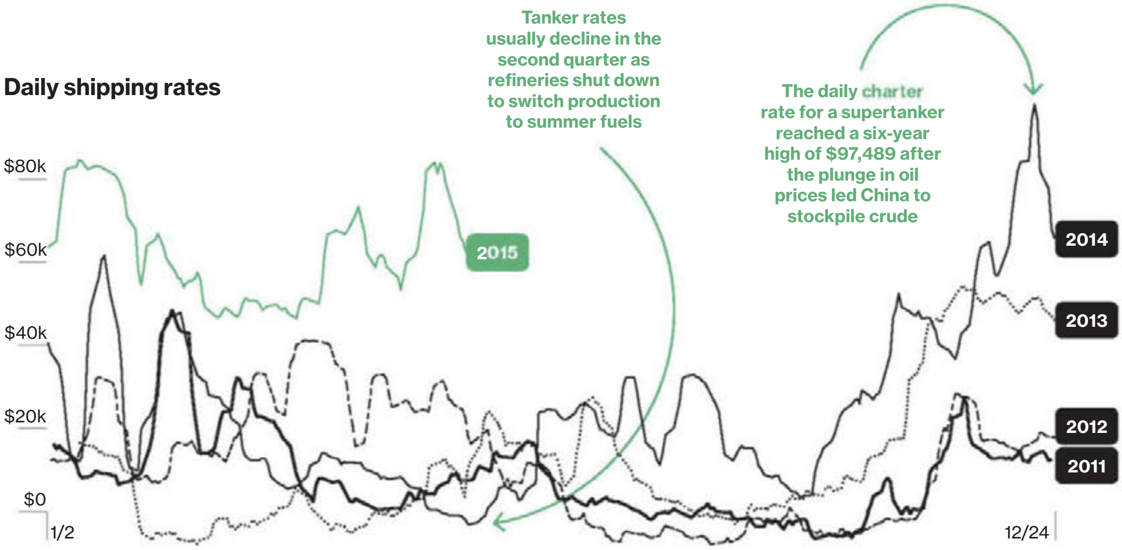
▶ "We're seeing all kinds of homes getting torn down"

Merion Homes bought two dozen ranch-style houses in Northern Virginia's Pimmit Hills community for about $450,000 each, just to knock them down. Now the builder is selling customized residences three times larger on the same lots at prices topping $1 million. "The original homes don't fit today's market," says Ryan Bensten, a principal of Merion Homes, which he started with his father, Bill. "They don't have enough bedrooms—they're too small."

Teardowns of older houses are becoming more common, says Robert Dietz, an economist with the National Association of Home Builders. The trade group estimates that builders around the country demolished and reconstructed about 32,000 homes last year, representing 5 percent of all single-family housing starts. It hasn't

Shipping Full Tankers Threaten the Oil Rally

Demand for oil supertankers has sent daily shipping rates soaring above seasonal norms on the industry's benchmark Middle East-to-Asia route. This is a sign that the world is still awash in crude. That abundance could end the rally that's seen oil prices climb 38 percent from January's six-year low. —*Naomi Christie and Bill Lehane*



Oil on water

485m
Barrels of oil OPEC nations will have in transit to buyers as of early June

1.9m
Global surplus barrels of oil produced daily despite U.S. rig shutdowns, according to Goldman Sachs

20m
Barrels of oil that analysts estimate are being stored on ships

DATA: BALTIC EXCHANGE, COMPILED BY BLOOMBERG

done estimates for previous years.

In 2013 about 47 percent of owner-occupied homes in the U.S. were at least 40 years old, up from 27 percent in 1991, according to an analysis of U.S. Census Bureau data by the NAHB. The land is often more valuable than the aging homes in suburbs such as Pimmit Hills, a 65-year-old neighborhood in Fairfax County outside Washington. Last year, 455 single-family homes were demolished in Fairfax County, the most since the county started tracking the data in 2006. "It's all about traffic jams—people can have nice houses far out in outer suburbs, but the commute time is impossible," says Lawrence Yun, chief economist of the National Association of Realtors. "This is an ongoing process, because older-built homes happen to be closer to job centers and may not meet the needs of modern homebuyers."

In McLean, an upscale Fairfax County suburb that's home to former Vice President Dick Cheney, as well as Freddie Mac and Capital One Financial, builders are paying more than $1 million for homes they plan to demolish, says Casey Margenau, a broker who's worked in the area for 26 years. The new houses, often finished with stone and fiber-cement siding, sell for about $4 million, he says.

Driving through the quiet neighborhoods surrounding McLean's Langley High, ranked the second-best public school in Virginia by *U.S. News & World Report*, Margenau can spot the next targets, such as a brick ranch surrounded by newer homes triple its size. "That one will go," he says on an overcast April afternoon. "It has a carport—not even a garage." The older homes in the community are "functionally obsolete," he says. The kitchens are enclosed, the ceilings are low, closets and windows are too small.

HEATHER PERLBERG/BLOOMBERG

A new home in Pimmit Hills

Residents in communities such as McLean complain that big and boxy McMansions undermine the character of neighborhoods, and building them destroys trees and creates constant noise. In 2013 the Minneapolis suburb of Edina hired a residential redevelopment coordinator to take complaints from residents and enforce teardown rules, a job that includes issuing tickets to illegally parked construction vehicles. The city of 49,000 residents had 130 demolitions last year, the most in its history, says Cary Teague, community development director. "We're seeing all kinds of homes getting torn down—'50s-style ramblers are coming down, but also million-dollar homes, and 4, 5, or $6 million homes are getting built," Teague says. The Los Angeles City Council has stopped issuing construction permits for new single-family homes in 20 neighborhoods, including Bel Air, in a move to stop teardowns.

In Pimmit Hills, some residents see an upside. The community was established for returning World War II veterans. "It was blue-collar, but more middle-class people are moving in," says Ning Yim, an accountant who owns an older home. "We like it when we see more new houses," says Quy Phung, Yim's husband. "It brings up the property values." The Benstens ▶

◀ of Merion Homes are marketing their collection of Pimmit Hills lots like a new housing development. Customers can visit model homes in the neighborhood and are greeted by a salesperson offering a choice of lots and floor plans. Merion has sold five houses in the community this year, and 19 other sites are available. "I'd be overly aggressive in saying that in five years it will be totally transformed," Ryan Bensten says. "But I do think it will look a heck of a lot different." —*Prashant Gopal and Heather Perlberg*

The bottom line An estimated 32,000 homes were torn down and replaced last year, representing 5 percent of U.S. housing starts.

Commodities

The Rise of the National Trading House

▶ Countries want to have more control of their natural resources

▶ "State-owned companies and risk taking do not go together that well"

In March, Azerbaijan's state-owned oil company **Socar Trading** took over the remnants of Phibro, a storied commodities trader. In buying the U.S. company, which dominated commodities markets for most of the 20th century, Azerbaijan became part of a growing global trend: states forming their own companies to buy and sell natural resources.

Azerbaijan joined Saudi Arabia, China, Oman, Thailand, and Russia, which are all building or expanding state-owned companies that procure and market grains, oil, metals, and other commodities directly, bypassing traditional traders such as **Glencore** and **Cargill**. "Countries want to secure the offtake of their production, or they want to secure supplies," says Socar Trading Chief Executive Officer Arzu Azimov. "There is a trend of national companies building trading arms."

Commodity houses are the middlemen of global trade, controlling the flow of fuels, grains, and metals between producers and users. The new state trading houses have built themselves up through acquisitions and rapid internal growth, often poaching executives from U.S. and European competitors. With plenty of money at their disposal, and privileged access to the natural resources of the countries that own them, they could take business from the current market leaders. "The rise of the state-owned traders is an inevitable negative for the traditional trading houses: It increases competition," says Alex Griffiths, head of natural resources at Fitch Ratings.

Chinaoil, jointly held by **China National Petroleum** and **Sinochem**, was one of the first of the new breed—and maybe the most successful. Started in Beijing in 1993, Chinaoil expanded to New York and Singapore, increasing its trading volume by 15 percent a year. Today, Chinaoil is one of the biggest traders of Middle Eastern crude. A decade ago it handled about 1 million barrels a day. Last year the figure was 2.6 million—as much as **Trafigura**, the third-largest independent oil trader.

Over the past two decades, **China Petroleum & Chemical**, or Sinopec, has built its Unipec arm into a behemoth, with $170 billion in annual revenue—more than Cargill—and trading volume of 4.2 million barrels a day last year, making it No. 5 in the world. In grains, China's **Cofco** last year spent $3.5 billion to buy stakes in the Netherlands-based **Nidera** and Hong Kong's **Noble Agri** and subsequently hired an executive from Archer Daniels Midland to spearhead its trading efforts. David MacLennan, CEO of Cargill, has called Cofco's plans "transformational."

Gazprom Marketing & Trading began life as an arm of Russia's state-owned gas company **Gazprom** 16 years ago with two traders in London's sleepy suburb of Richmond. The unit, which tripled its profit from 2008 through 2013, has hundreds of employees in the U.K., Houston, Singapore, and elsewhere.

2.6m

Barrels a day of Mideast crude Chinaoil handled last year

The state-owned companies, often

FROM LEFT: ILLUSTRATION BY SIMON ABRANOWICZ; PETER FOLEY/BLOOMBERG

under tight political control, will have to see whether their overseers have the stomach to accept trading losses—common in the commodities business—and show they have the nimbleness to pounce on opportunities. When the earthquake and tsunami hit Fukushima in 2011, the established trading companies reacted immediately. Anticipating higher demand for fuel oil in Japan, they were able to redirect tankers from as far away as Chile. "The main problem is that state-owned companies and risk taking do not go together that well," says Graham Sharp, a co-founder of Trafigura, who is now an adviser to consultants Oliver Wyman. "Culturally it is a difficult fit."

The rise of the state traders echoes the coming-of-age of the national oil companies in the 2000s, when corporations such as Brazil's **Petróleo Brasileiro** and Russia's **Rosneft** came to play a major role in the resources industry. The rationale is also similar: Keep control of commodities within the state. For these traders, profitability is not paramount—national objectives come first. As Azimov of Socar puts it, "We always protect the interest of our countries." —*Javier Blas*

The bottom line Azerbaijan's purchase of Phibro is the latest example of countries building natural resources trading houses.

Debt

Need a Risky Loan? That's a Job for Jefferies

- An investment bank does deals that are off-limits to bigger rivals
- "Their hands are tied by the regulators"

When private equity firm **Veritas Capital** picked **Jefferies Group** to manage a $1.4 billion buyout loan in May, it passed over some much bigger Wall Street names, including **Morgan Stanley**, **Barclays**, and **UBS**. Why? Because Jefferies offered something that none of the larger rivals could, say people with knowledge of the matter: Jefferies isn't among the institutions covered by federal guidelines meant to reduce risk levels in the financial system, so it can arrange loans that saddle borrowers with substantial debt burdens.

Jefferies has been one of the biggest beneficiaries of the government's efforts to prevent another financial crisis by reining in risk-taking big banks. Because it doesn't take deposits like **JPMorgan Chase** and **Citigroup**, it faces less stringent regulation and can scoop up risky deals the others can't touch. "Of course other banks are not happy," says Robert Harteveldt, former head of leveraged finance at Jefferies. "But guess what? To a degree, their hands are tied by the regulators."

Owned by **Leucadia National** and run by Richard Handler, Jefferies soared last year to sixth in the rankings for underwriting loans used to finance leveraged buyouts, according to data compiled by Bloomberg. In 2012 it did not make the top 10. Since the start of 2014, the bank has managed more than $10 billion worth of loans for private equity sponsors that had previously had lending relationships with other banks. In most of these transactions, the leverage levels—the borrower's total debt compared with its earnings—exceeded lending guidelines that federal regulators apply to large banks.

The Federal Reserve, the Office of the Comptroller of the Currency (OCC), and the Federal Deposit Insurance Corp. introduced those guidelines in March 2013 to curb excessive risk taking. Although the guidelines are not strict rules, regulators have told lenders that if they make too many risky loans, they could face fines or suspensions. The crackdown has led to banks underwriting fewer loans and collecting less in fees.

Executives from at least 7 of the top 10 leveraged-loan underwriters in the U.S. have complained to regulators including the Fed and the OCC that Jefferies is still doing deals that regulators deem too risky for their firms, say people at the firms, who asked not to be identified discussing private conversations. Harteveldt says sniping from rival bankers is nothing more than sour grapes. "People love to talk about how Jefferies is the aggressive bank that takes on dodgy deals," says Harteveldt, now chief executive officer of hedge fund Trishield Capital Management. "If that were true, then you wouldn't have other banks who want to do the same deals." Spokesmen for the OCC and ▶

◀ the Fed declined to comment on the banks' complaints.

Jefferies's latest score was the lead job underwriting the debt for Veritas Capital's $2 billion buyout of aircraft maintenance firm StandardAero. The private equity firm is acquiring the business from Dubai Aerospace Enterprise. In addition to Morgan Stanley, Barclays and UBS, Jefferies also beat out **Credit Suisse** and **Royal Bank of Canada**, say two people with knowledge of the matter, who declined to be identified discussing private negotiations.

The loan would push StandardAero's total debt to more than seven times earnings before interest, taxes, depreciation, and amortization, a higher level than the big banks believed would be acceptable to regulators, according to the people. **KKR** will help arrange the loans, they say. Representatives of Veritas Capital, Barclays, Credit Suisse, Morgan Stanley, RBC, and KKR declined to comment. A spokeswoman for UBS didn't respond to requests for comment.

Kevin Lockhart, co-head of global leveraged finance at Jefferies, attributes the firm's recent successes to things such as its "consistent underwriting standards" and "first-class execution and distribution." He wouldn't comment on the impact that the new lending regulations have had on his business.

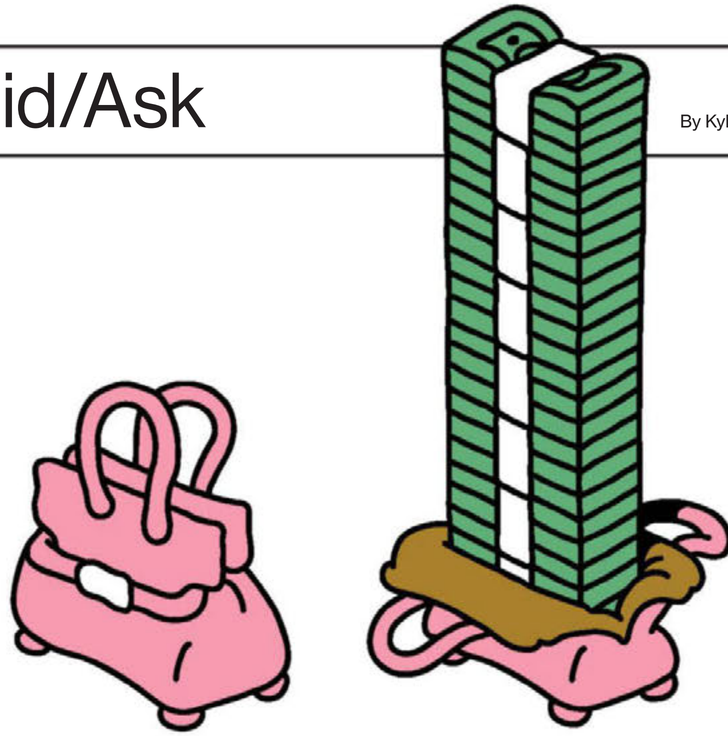
Not all deals have been successful for Jefferies. In the last quarter of 2014, the bank had to sell loans it arranged for at least three companies–**Toms Shoes**, **Compuware**, and **Tibco Software**–at a discount, data compiled by Bloomberg show. Yet even money-losing deals can have longer-term benefits. Jefferies's ability to do riskier deals helps it forge relationships with private equity firms that may then give Jefferies a piece of lower-risk transactions, too. "The rules are not fair to the regulated banks," says John McClain, a money manager at Diamond Hill Investment Group in Columbus, Ohio. "Markets adjust to what's going on, and participants like Jefferies step in to fill a void." —*Nabila Ahmed and Sridhar Natarajan*

The bottom line An ability to shoulder more risk has helped Jefferies move up to sixth in the rankings for underwriting buyout loans.

Edited by Eric Gelman
Bloomberg.com

Bid/Ask

By Kyle Stock



$222k

A Hermès handbag sets an auction record. The fuchsia crocodile Birkin purse with gold and diamond studs sold at a Christie's in Hong Kong. Named for actress Jane Birkin, the bags sell at retail for about $8,000, and buyers often wait months to get one. The previous auction record for a purse was $203,000, paid for another Birkin in 2011. The sale moves the handbags a bit further from fashion statement to asset class.

$16.7b **Intel buys Altera.** The purchase will speed the company's transition from supplying chips for PCs to serving data centers and a wider range of consumer electronics.

$2.2b **Enterprise Products acquires pipelines in Texas.** The company gains assets from Pioneer Natural Resources and Reliance Industries, drillers hurt by lower oil prices.

$1b **Apollo Global Management takes OM Group private.** The industrial giant specializes in producing complex chemicals and batteries.

$838m **Ferrellgas Partners purchases Bridger Logistics.** The acquisition gives the propane retailer a foothold in the business of storing, piping, and trucking crude oil.

$604m **British American Tobacco extends its reach.** BAT buys TDR, maker of popular cigarette brands in central Europe, which has some of the world's highest smoking rates.

$560m **Playtech scoops up Plus500.** Shares in the financial trading company had plunged amid a U.K. regulatory review of its anti-money laundering controls.

$147m **Boot Barn lassoes Sheplers.** The Western-wear retailer gets eight stores and a shirts and jeans business that generates about $157 million in annual sales.

ILLUSTRATIONS BY OSCAR BOLTON GREEN


YOU MAY BE OUTNUMBERED,
BUT NEVER OUTSMARTED.

Hacking the One-Room Schoolhouse

PHOTOGRAPH BY TIMOTHY ARCHIBALD FOR BLOOMBERG BUSINESSWEEK

▶ **A Silicon Valley experiment in individualized learning has some big-name backers**

▶ **"I don't think of it as an elementary school system. I think of it as a gigantic software system"**

Emma Eisner, a 12-year-old with short hair dyed green in parts, has roped off an area around an art installation she's building. "Go away, child," reads a handwritten sign warding off classmates. About 10 feet long and 3 feet tall, the cardboard structure looks like an elaborate tunnel, or maybe a spaceship. Actually, she says, "it's about how the human quest for knowledge has turned the world inside out."

There are no desks in this sixth-grade classroom, in San Francisco's Marina neighborhood, just some tables pushed together along one wall and a bunk bed, where three boys wearing Beats headphones sit working on laptops. Out on the rooftop patio, two students are taking measurements for a garden. "They want to be able to go have tea and meditate," explains Carolyn Wilson, the school's head of education.

These kids are students at **AltSchool**, a for-profit network of elementary schools founded by former **Google** executive Max Ventilla and backed by $133 million from **Facebook** founder Mark Zuckerberg and venture capitalists. Starting with 15 students in a single classroom in 2013, it's expanded to 400 students in eight K-8 schools in San Francisco and Palo Alto. Tuition is $21,000 a year, with one-third of students on scholarships. The first school outside California is scheduled to open in Brooklyn, N.Y., in the fall of this year.

AltSchool's goal is to do away with the standard curriculum and instead use data capture and analysis to tailor lessons to each student. Just as Google display ads are customized to a person's browsing habits and Netflix recommends movies based on a viewer's taste, AltSchool designs a curriculum for each pupil. "We've literally built an operating system for a 21st century school system," says Ventilla, 35, who at Google was in charge of "personalization," an effort to build a single profile of each user by pooling data on their search history, Gmail traffic, ▶

◀ Google Map queries, and YouTube viewing habits—all with the goal of making customized search results and other features.

Evidence of AltSchool's Silicon Valley pedigree is everywhere. Cameras and microphones embedded in the ceiling and walls record interactions so teachers can assess how students are doing. A projector screen on one wall displays a video-game-style leader board with points for finished work and good behavior. Students who can't make it to school can teleconference in via a robot that looks like an iPad on stilts. And, of course, there's a 3D printer, which students recently used to make candy. Teachers can earn $90,000 a year or more, plus an annual bonus. And because the company is a startup, they get equity.

AltSchool uses software built by engineers recruited from Google, **Zynga**, and other Silicon Valley companies. The key is to quantify as many metrics as possible about a child, from reading and math abilities to personality traits and social skills—and to use that data to determine what she's taught. If a child expresses interest in a certain book, a teacher will craft a lesson around it. Same goes for the child who wants to be a DJ, build a drone, or master meditation. Parents offer input on which skills they want emphasized for their child. Teachers compile the information and build a weekly "playlist"—AltSchool's term for a lesson plan—for each student.

Instructors log students' progress in an online database. If a lesson is successful, it may be used on another child with a similar personality and skill level. GPS-enabled wearable devices are in the works to allow teachers to keep tabs on students' whereabouts inside the school. AltSchool is also testing a tool that generates lesson recommendations for children. "I don't think of it as an elementary school system," says Lars Dalgaard, a partner at **Andreessen Horowitz**, one of the company's main backers. "I think of it as a gigantic software system." (Bloomberg LP, which owns *Bloomberg Businessweek*, is an investor in Andreessen Horowitz.)

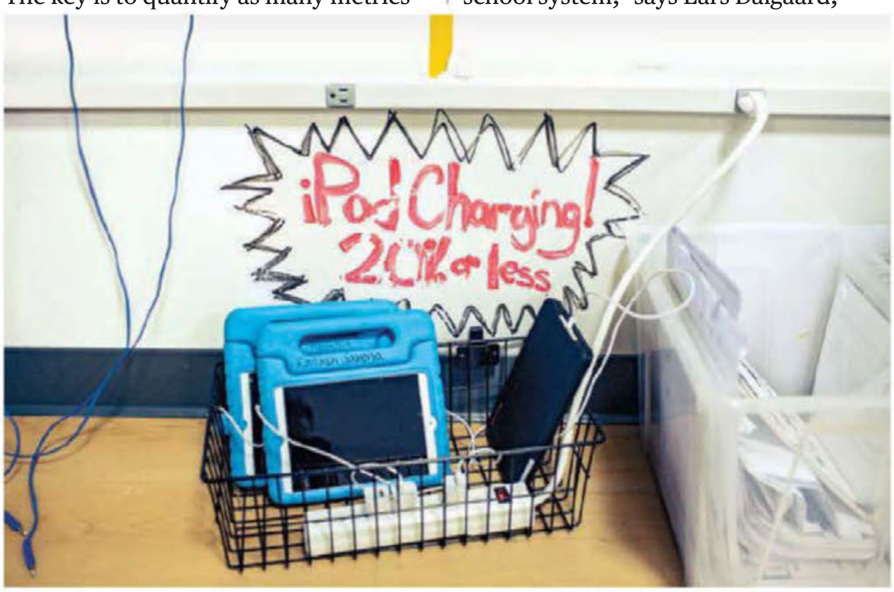

Ventilla

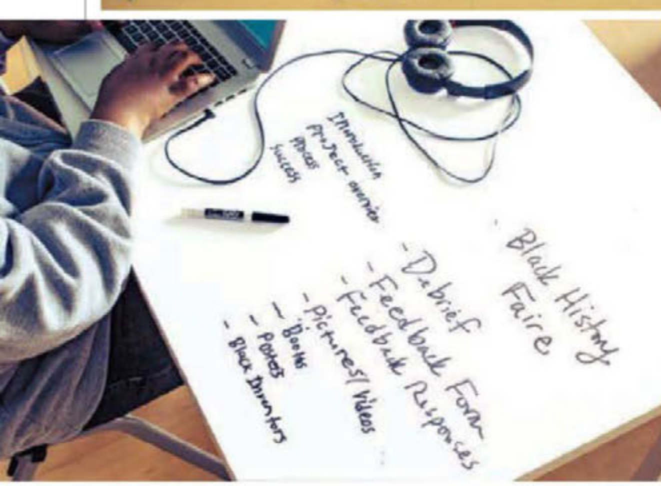
Brian Rodgers, a Web developer in San Francisco, says he chose to send his daughter, age 7, to AltSchool because she wasn't getting enough attention at her public school, where many students spoke English as a second language. "We liked the idea that she would be able to grow in the directions that interest her," he says.

After attending a recent presentation at AltSchool's San Francisco headquarters, Reece Hart, a software engineer who'd been considering enrolling his 10-year-old daughter, decided against it. "I'm pretty uncomfortable on lots of levels with kids being the widgets of a VC firm," he says. "That scares me for my own kids and for society."

Katie Davis, a professor at the University of Washington who's studied the role of technology in schools, says AltSchool is reminiscent of many public charter schools that open with a blast of money, energy, and excitement before sputtering out as the day-to-day challenges of running a school take their toll. "That original vision gets lost somewhat, and the same old problems emerge," she says. While research suggests that an individualized learning approach can be effective, the bigger challenge will be scaling beyond an enthusiastic, and well-to-do, group of parents in Silicon Valley. "It's easier in private schools and charter schools, because they tend to have more resources, smaller classes, and more technology," Davis says. "In a lot of public schools, teachers are really stretched thin, and they are more in survival mode."

AltSchool is clearly tapping into parental desires for a new approach to





PHOTOGRAPHS BY TIMOTHY ARCHIBALD FOR BLOOMBERG BUSINESSWEEK

education. Charter school enrollment rose to 2.5 million students last year, up from 350,000 in 2000. Ventilla won't release data on how AltSchool's students perform on state-mandated standardized tests or internal assessments, but he says early results are promising. Ventilla, who expects to send his own kids, age 2 and 4, to AltSchool, has an ambitious plan to double enrollment every year by opening "microschools" in other large U.S. cities. "When you come from a place like Google, scalability gets spliced into your veins," he says.

The son of Hungarian parents, Ventilla knows firsthand what a difference the right school can make in a child's life. He credits a scholarship to the Buckley School, a private elementary school in Manhattan, with launching him on a trajectory that included attending an elite Massachusetts prep school, a B.A. and an MBA from Yale, a stint as an entrepreneur, and a job at Google. "There's this horrific notion that you need to pick your preschool based on what elementary school you want your kid to go to, with the obvious implication being, that leads to high school and college, and if you don't pick right for your 2-year-old, they are going to be penniless and alone in their 30s," he says. "What's most awful about that is, there actually is some truth to it."

—Adam Satariano

The bottom line Backed by $133 million in investor money, AltSchool serves 400 students and plans to grow.

Health Care

A Text a Day Keeps The Doctor Away

▶ Companies offer workers digital tools to prevent diabetes

▶ "I was monitored. I was held accountable. There was no hiding"

Two years ago, **Iron Mountain**, the Boston-based records storage company, discovered through medical screenings that at least 1,400 of its 8,200 U.S. employees had an elevated glucose level, a sign they were at risk for developing diabetes. To head off an increase in medical costs, the company in January began giving its workers the option of signing up for a diabetes-prevention program developed by **Omada Health**, a San Francisco startup whose backers include angel investor Esther Dyson and Kaiser Permanente Ventures.

Anatomy of an Epidemic

29m Americans age 20 or older have diabetes

86m Have prediabetes

$245b Cost of lost work and wages and treating the disease in 2012

Without losing weight or increasing physical activity, 15 percent to 30 percent will develop diabetes within five years

DATA: CDC, AMERICAN DIABETES ASSOCIATION

Omada's Prevent program uses input from wireless scales, pedometers, and digital food and exercise diaries to encourage people to become more active and lose weight. The company says its software can predict who will have trouble shedding pounds or sticking with the program; its motivational coaches offer them extra help. "Even as early as weeks three or four, we can pretty much tell how people are going to do," says Omada's medical director, Cameron Sepah. "Some people need more hand-holding."

Other startups that have launched digital services similar to Omada's include Toronto's **Newtopia** and New York's **Noom**. The Centers for Disease Control and Prevention (CDC) concluded last year that digital diabetes prevention programs can be as effective as those requiring attendance at regular group sessions led by trained coaches.

> **"Even as early as weeks three or four, we can pretty much tell how people are going to do."**
> ***—Cameron Sepah, Omada Health***

The number of Americans diagnosed with diabetes almost doubled from 1998 to 2011, to about 21 million, according to the CDC. The jump reflects more sedentary lifestyles, rising rates of obesity, and an aging population. An additional 86 million people age 20 and older are believed to be prediabetic, defined as having fasting blood glucose in the range of 100 milligrams to 125mg per deciliter. (A normal range is 70mg to 100mg/dl.) "There's a tremendous opportunity to prevent disease progression," says Matt Petersen, managing director of medical information at the American Diabetes Association (ADA), which estimates the cost of medical care and lost productivity from diabetes totaled $245 billion in 2012.

The pool of data that can be parsed to develop digital tools for disease prevention and management is growing, thanks to smartphones, which consumers can use to log meals and time spent at the gym. They also use them to receive instruction and encouragement from a health coach. Wearables such as the Fitbit wristband and the Apple Watch can gather information on a person's activity level and sleep habits. "This is a seminal moment. What better place to start than with one of the epidemics in health care today—diabetes?" asks Dr. Michael Weiner, chief medical information officer at **IBM**, which is working with medical device maker **Medtronic** on a system to help avert sudden glucose spikes and drops by prompting diabetics to take preemptive actions, such as taking a walk before a dinner heavy on carbs.

For Prevent, Omada groups enrollees into small teams that spend the first 16 weeks of the program logging their weight, meals, and exercise using its app or online portal and sharing their experiences with the group. Individuals also complete online lessons on topics such as nutrition and fitness. Omada collects data ranging from frequency of weigh-ins to duration of logins to gauge whether someone's commitment is flagging, so a coach can intervene. "I was monitored. I was held accountable. There was no hiding," says Carol Genis, one of 877 Iron Mountain employees who signed up for the program in January. Genis has lost 13 pounds since January.

Costco, **Kaiser Permanente**, and **Lowe's** have also signed up to offer Prevent to their employees. Omada expects to have 100,000 people enrolled before the end of 2016, up from about 10,000 today. The company says the cost to a company is based on results and ranges from about $40 to $60 per pound lost. For its program, Newtopia lets users submit saliva samples to test for three specific weight-related genes, so it can better tailor nutrition, exercise, and behavior-management recommendations. It also uses surveys to compile information on personality types, which it uses to match people with coaches. "Think EHarmony for coaches," says Chief Executive Officer Jeff Ruby. ▶

◀ Newtopia began offering its prevention program to businesses two years ago and has enrolled 4,000 people so far; it wants to quadruple its user base by the end of 2016. Newtopia charges businesses an average of $500 per active participant in the first year and $300 in the second year, and it offers money-back guarantees for those who try but fail to get results. Dr. Greg Steinberg, head of clinical innovation at **Aetna**, where 470 employees used Newtopia, says the insurer recouped what it spent on the program in a single year, via lower medical costs. That "is pretty unusual for a wellness program," he says.

Legislation recently introduced in the U.S. Congress would make data-driven diabetes prevention programs eligible for Medicare reimbursement. Diabetes is more prevalent among the elderly and the poor: While 9.3 percent of the entire population has the disease, the proportion rises to 25.9 percent among those age 65 or older, according to the CDC. "A lot of people focus on diabetes's relationship with weight, but it has just as strong a correlation with age," says the ADA's Petersen. —*Olga Kharif and Caroline Chen*

The bottom line Data-driven programs targeting diabetes have become a part of corporate wellness offerings.

Job Market

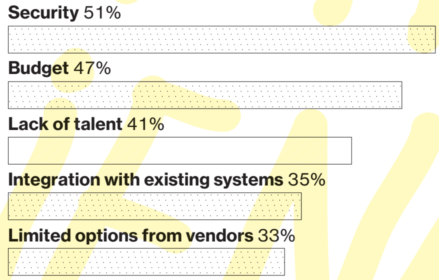
Help Wanted: Black Belts in Data

▶ Starting salaries for data scientists have gone north of $200,000

▶ The shortage "will get worse before it gets better"

A new species of techie is in demand these days—not only in Silicon Valley, but also in company headquarters around the world. "Data scientists are the new superheroes," says Pascal Clement, the head of Amadeus Travel Intelligence in Madrid. The description isn't exactly hyperbolic: The qualifications for the job include the strength to tunnel through mountains of information and the vision to discern patterns where others see none. Clement's outfit is part of **Amadeus IT Holding**, the world's largest manager of flight bookings for airlines, which has more

Calling All Number Crunchers
In a survey, more than 1,000 executives rated obstacles to implementing a big-data strategy



DATA: ACCENTURE

than 40 data scientists on its payroll, including some with a background in astrophysics. The company recently launched Schedule Recovery, a product that tracks delays and automatically rebooks all affected passengers.

A study by McKinsey projects that "by 2018, the U.S. alone may face a 50 percent to 60 percent gap between supply and requisite demand of deep analytic talent." The shortage is already being felt across a broad spectrum of industries, including aerospace, insurance, pharmaceuticals, and finance. When the consulting firm Accenture surveyed its clients on their big-data strategies in April 2014, more than 90 percent said they planned to hire more employees with expertise in data science—most within a year. However, 41 percent of the more than 1,000 respondents cited a lack of talent as a chief obstacle. "It will get worse before it gets better," says Narendra Mulani, senior managing director at Accenture Analytics.

Many data scientists have Ph.D.s or postdoctorates and a background in academic research, says Marco Bressan, president for data and analytics at **BBVA**, a Spanish bank that operates in 31 countries and has a team of more than 20 data scientists. "We have nanotechnologists, physicists, mathematicians, specialists in robotics," he says. "It's people who can explore large volumes of data that aren't structured."

So-called unstructured data can include e-mails, videos, photos, social media, and other user-generated content. Data scientists write algorithms to extract insights from these troves of information. But "true data scientists are rare," says Ricard Benjamins, head of business intelligence and big data at **Telefónica**, Europe's second-largest phone company, which employs more than 200 of them. Says Stan Humphries, chief economist at **Zillow**, the real estate listings site: "You can find a great developer and a great researcher who has a background in statistics, and maybe you can find a great problem solver, but to find that in the same person is hard."

Universities are taking note. MIT, where graduate students in physics, astronomy, and biology are fielding offers from outside their chosen fields, is in the process of setting up a dedicated data-science institute. Marilyn Wilson, the university's associate director for career development, says the center will begin enrolling graduate degree candidates in 2016.

In the U.K., the University of Warwick introduced a three-year undergraduate data-science program last year, which David Firth, the program's mastermind, says may well be the first of its kind. "Big Business was complaining about the lack of people," he says. "Finance is a major employer, but also large-scale insurers, large online commercial retailers, high-tech startups, and government, which has huge data sets."

Accenture's Mulani says he's tallied some 30 new data-science programs in North America, either up and running or in the works. The University of Virginia began offering a master's in 2014, as did Stanford. Many of those students may be tempted to drop out before collecting their degree. "Companies are scrambling," says Margot Gerritsen, director of Stanford's Institute for Computational & Mathematical Engineering. "We have second- and third-year students getting offered salaries much higher than what I get." Starting pay for some full-time jobs is above $200,000, she reports. Summer internships, meanwhile, pay anywhere from $6,000 to $10,000 a month. To make these stints memorable, many employers offer perks such as free meals, complimentary gym memberships, and occasionally temporary housing. "Sometimes you read about students getting abused in internships and working like slaves," Gerritsen says. "We don't see that." —*Rodrigo Orihuela and Dina Bass*

The bottom line McKinsey projects that by 2018 demand for data scientists may be as much as 60 percent greater than the supply.

Edited by Cristina Lindblad
Bloomberg.com


Mondelēz International is reinvesting savings to grow. And guess how much we're helping them save?
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OREO
Snack food powerhouse Mondelēz International® faced roadblocks to growth, from shifting tastes to a slowdown in consumer spending. To master these challenges, we helped them design and implement a strategic operating model and cost control strategy. Today, Mondelēz International is on track to save $1 billion in just 3 years. Now they can focus on what matters most – creating delicious moments of joy. That's high performance, delivered.
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How Much Should A Miracle Co

Thanks to two blockbuster drugs, millions of hepatitis C sufferers now have access to a cure, but insurance companies and lawmakers are balking at the price tag—$1,000 a pill and up. The story of a biotech breakthrough that ignited the latest U.S. health-care battle. **By Paul M. Barrett and Robert Langreth**

Shima Andre, a 42-year-old freelance book editor in West Hollywood, Calif., learned she had hepatitis C while attending a Christmas party one evening in December 2011. Her doctor called via cell phone to say a routine blood test during her annual physical exam revealed she carried the liver-wasting virus. Now she and her husband—they'd married a few months earlier—would have to postpone their plans to have kids until she was clear of the potentially fatal disease. Andre concluded she'd probably contracted it from a drug habit she'd kicked years earlier.

More than 3 million Americans have hepatitis C, an infectious illness spread by addicts' needles, poorly sterilized medical instruments, and, in the years before current blood bank screening standards, ordinary transfusions. Like Andre, many hepatitis C sufferers go for years without noticing symptoms. During that time the liver can scar, leading in some cases to cirrhosis, cancer, and organ failure. At the time Andre was diagnosed, the standard treatment included an injected medicine called interferon that offers uncertain prospects for a cure and causes such severe side effects as flu-like symptoms,

anemia, and depression. After consulting her physician, Andre decided to delay treatment until the arrival of better medicines said to be in the pipeline.

Last October, Gilead Sciences of Foster City, Calif., introduced Harvoni, which completely cures the vast majority of people with the most common type of hepatitis C and does it in just three months with few significant side effects. Gilead charges $94,500 for the 12-week treatment. Andre, who pays $614 a month for health insurance for herself and her husband, applied for reimbursement for Harvoni. Her insurer, Anthem, the nation's second-largest health insurer, turned her down. In a series of letters, the company noted she doesn't have serious liver scarring. "This drug is considered not medically necessary," Anthem told her.

On May 15, Andre sued Anthem in state court in California for breach of contract. "It is a life-threatening disease," she says. "There is no reason I should have to wait until my liver deteriorates before I get a cure." Already, she says, her urine has turned dark, and she's experiencing sharp liver pain. Lori McLaughlin, an Anthem spokeswoman, declined to comment on Andre's complaint because it's in litigation. In general, McLaughlin adds, Anthem covers Harvoni "for members with more advanced stages of liver disease."

Over the past 18 months, the emergence of Harvoni and its predecessor, Sovaldi, has given tens of millions of hepatitis C patients around the world hope that they can be permanently rid of a debilitating illness. Not since the introduction of HIV/AIDS drug cocktails almost two decades ago has the appearance of a therapy spurred such demand. Unlike drugs for HIV, which control infection and must be taken for the rest of a patient's life, Harvoni and Sovaldi typically eliminate

the virus they target and do so quickly. (Sovaldi is taken with interferon or a third drug; Harvoni combines Sovaldi with another Gilead compound into one pill and eliminates the need for interferon.)

The promise of a cure, however, doesn't come cheap. After Sovaldi received approval from the U.S. Food and Drug Administration in December 2013, Gilead announced the drug would cost $84,000 for a 12-week course, or exactly $1,000 a pill. That's more than double what Pharmasset, the biotech company that developed an early experimental version of the drug, initially said it planned to charge—until Gilead bought Pharmasset in 2011. For 2014, Sovaldi generated $10.3 billion in sales, making it one of the most lucrative pharmaceutical launches ever. In just the final three months of 2014, Harvoni added $2.1 billion. Gilead's market capitalization has soared from $29 billion to $167 billion in five years. The net worth of its chief executive officer, John Martin, exceeds $1 billion.

Because of the blockbuster sales of Gilead's two hepatitis C drugs, the company has become the focus of a backlash against the costs of expensive "specialty" drugs that target chronic diseases such as hepatitis, cancer, and multiple sclerosis. Drug spending in the U.S. totaled $330 billion in 2013, according to Anthem. By 2020, spending on specialty drugs alone could reach $400 billion. Patients who receive these treatments almost never see the total cost, but their insurers do. More than two dozen state Medicaid programs for low-income patients, as well as for-profit insurers such as Anthem, have restricted coverage for Sovaldi to those with severe liver damage. "Never before have drugs been priced so high to treat such a large population," says Steve Miller, chief medical officer at Express Scripts, the country's largest manager of drug benefits for employers and insurers. In December, Express Scripts announced it would reject coverage for one-pill-a-day Harvoni and instead steer patients to a less pricey rival drug that requires four to six pills a day.

Congress has also jumped into the fray. Last July, Ron Wyden (D-Ore.), then chairman of the Senate Finance Committee, and ranking minority member Charles Grassley (R-Iowa) demanded in an eight-page, single-spaced letter to Gilead that the company provide an itemized accounting of its R&D costs, marketing expenses, and plans for selling Sovaldi at lower prices overseas. "Given the impact Sovaldi's cost will have on Medicare, Medicaid, and other federal spending, we need a better understanding of how your company arrived at the price for this drug," they wrote.

Gilead executives insist that because their drugs quickly cure hepatitis C—saving patients, hospitals, and insurers the costs of long-term care—they're well worth the price. The suggestion that the company's pricing is motivated by greed is "perplexing," says Chief Scientific Officer Norbert Bischofberger. "Price is the wrong discussion," says Gregg Alton, Gilead's executive vice president for corporate and medical affairs. "Value should be the subject." Martin, the CEO, points out that before tackling hepatitis C, the company pioneered combination HIV drugs, blending compounds invented elsewhere with in-house discoveries to make medications easier for patients to take. "For a long time we've had innovation after innovation," he adds. For many patients, Gilead's drugs are indeed miraculous. But is the U.S. health-care system paying too much for them?

"Never before have drugs been priced so high to treat such a large population"

The son of husband-and-wife chemists, Martin received his doctorate in organic chemistry from the University of Chicago and then, before the age of 30, invented a drug that proved helpful in ameliorating certain HIV symptoms. He has received the prestigious Isbell Award from the American Chemical Society and in 2008 was inducted into the National Academy of Engineering. In an interview in his Spartan corner office at Gilead's headquarters south of San Francisco, the media-averse Martin slouches, swallows his words, and rubs his head until his brown hair resembles a well-trafficked bird's nest.

He gets up from the conference table to retrieve a visual aid: Several chapters in *Nucleotide Analogues as Antiviral Agents*, a 1989 collection he edited, describe research that has since contributed to FDA-approved drugs. Picking up a green marker and moving to a whiteboard, Martin, 64, seems to relax. He sketches the intricate molecular structure of tenofovir disoproxil fumarate. Useful for treating HIV, he explains, this "reverse transcriptase inhibitor" put Gilead on the map in 2001. Using the drug's trade name, he adds: "That's Viread!"

Gilead CEO Martin is worth more than $1 billion

Gilead was founded in 1987 by Michael Riordan, a physician with a Harvard MBA. He named the company for the "balm of Gilead," an ancient healing resin mentioned in the Bible. Riordan sought to commercialize so-called antisense treatments for genetic disorders, but his plans fizzled in the lab. In 1996, Riordan was replaced as CEO by Martin, who'd joined Gilead from Bristol-Myers Squibb hoping to pursue antiviral therapies based on his research on nucleotides, organic molecules that serve as building blocks of DNA and RNA. The company's chairman was Donald Rumsfeld, who stepped down in 2001 to become President George W. Bush's secretary of defense. Martin later took on the chairman's title as well.

In 2002, Martin engineered the acquisition of Triangle Pharmaceuticals, which brought Gilead a compound it combined with Viread to make Truvada, a best-selling anti-HIV drug. Gilead cut a deal two years later with Bristol-Myers Squibb to gain access to a third HIV drug, which Gilead added to the mix to create Atripla, the first AIDS medication that incorporated all the agents needed to treat the disease in a once-a-day pill. Atripla remains a major revenue source, generating $3.5 billion last year; Truvada brought in $3.3 billion.

Gilead learned from the blunders of old-line pharmaceutical companies that made first-generation HIV drugs but resisted lowering prices for patients in the developing world. In 2003 the company started a tiered pricing program for poor countries that included selling licenses to generic manufacturers in India. Halting at first, the initiative eventually became a model for the industry and has facilitated low-cost treatment for more than 7.5 million destitute AIDS patients.

Gilead's 7,500 employees are driven to get drugs into the hands of sick people, whatever their earning power, Martin says. "For the U.S. there's access [to the HIV treatments], and for Africa there's access, too," he says. That anyone would question the company's motivations strikes Gilead executives as ignorant, or even offensive. "Patients want and need

PAUL SAKUMA/AP PHOTO

Gilead's Big Jump

Market capitalization of major biotech companies

DATA: COMPILED BY BLOOMBERG

what we invent," says Alton. "These are amazing products. It's frustrating to hear the criticism that we're asking for too much."

By 2011, investors were fretting about the slowing growth of Gilead's HIV franchise and the eventual expiration of patents of key components of its combination therapies. Gilead joined several companies that were shifting resources to hepatitis C. In addition to the 3 million victims in the U.S., some 150 million people worldwide are thought to have the disease. Manufacturers Merck and Vertex Pharmaceuticals introduced drugs in 2011 that boosted cure rates but still required many months of toxic interferon and caused additional side effects. Gilead's biochemists searched for effective alternatives, Bischofberger recalls, but "nothing seemed to be working."

Rather than simply double down on their own R&D, Gilead management ordered its researchers to synthesize and test every competing compound, with an eye toward acquiring the best. For hepatitis C, a clear winner emerged: PSI-7977, an experimental pill developed by Pharmasset, a Princeton (N.J.) startup with 82 employees, no product on the market, and a $91 million loss for its prior fiscal year.

In September 2011, Martin and John Milligan, Gilead's president and another Ph.D. scientist, met with their counterparts at Pharmasset. They offered to buy the tiny company for $100 a share, or $8 billion. In early October, Pharmasset confidentially shared unpublished data showing that PSI-7977 cured all 40 patients in a clinical trial with no significant side effects. Martin and Milligan raised their offer to $125 a share. Sensing opportunity, Pharmasset responded by soliciting competing bids.

In November, Gilead went to $135 a share, then $137, or $11 billion, and there the deal was struck. With its three seniormost executives all recognized antiviral experts, Gilead could act decisively, says Geoffrey Porges, an analyst at Sanford C. Bernstein. "They didn't have to have 15 different committees analyzing it and writing reports," he says. The 94 percent premium Gilead paid above Pharmasset's trading price at the time amounted to the richest of any large drug industry acquisition.

Merger documents later filed with the Securities and Exchange Commission indicate that the other companies Pharmasset contacted never submitted formal offers. Milligan says Gilead's aggressive moves discouraged the competition. In a sense, though, Gilead bid against itself to secure the prize. Merger documents also revealed that Pharmasset tentatively considered introducing PSI-7977 with a price of $36,000, less than half the amount Gilead ultimately charged for a three-month treatment. (In an amended filing, Pharmasset later adjusted the projected price range to $36,000 to $72,000.)

Once it had PSI-7977, a nucleotide analogue known generically as sofosbuvir, Gilead moved to complete clinical testing while simultaneously shutting out competitors. At the time of the deal, Pharmasset had an agreement to test sofosbuvir in combination with another experimental hepatitis C drug made by Bristol-Myers. Ultimately, Gilead focused on its own in-house combinations, and the collaboration didn't move forward. Bristol-Myers, meanwhile, spent $2.5 billion on a separate hepatitis C acquisition in 2012. By the end of the year, though, it scrapped the main drug it acquired because of toxic side effects.

In 2013, Gilead took sofosbuvir to the FDA, proposing to market the compound as Sovaldi. Edward Cox, a senior official in the agency's drug evaluation center, called the approval that December "a significant shift in the treatment paradigm for some patients with chronic hepatitis C." Researchers with Bloomberg Intelligence estimated sales of hepatitis C medicines could exceed $100 billion over a decade, and Gilead had the best product on the market.

More and more pharmaceutical manufacturers are seeking to develop specialty drugs because of the rich payouts associated with Sovaldi and Harvoni. Profits can be so hefty because the American health-care finance system allows companies to charge more or less what they choose. In Europe, governments negotiate directly with manufacturers, which keeps prices lower. In the U.S., that doesn't happen. Medicare, the federal insurance program for senior citizens, is barred by law from using its size to negotiate discounts.

Until last year, specialty drug inflation had been partly masked by patent expirations on big sellers such as the cholesterol therapy Lipitor, which slowed the growth of overall spending on pharmaceuticals. But drug costs rose 13 percent in 2014, to $374 billion, the largest increase since 2001, much of it driven by a surge in spending on Sovaldi, Harvoni, and other specialty drugs, according to IMS Health, a New York consulting firm. Half of the 38 cancer drugs introduced since 2010 cost $10,000 a month or more. All were at least $5,000 a month, according to data from Memorial Sloan Kettering Cancer Center in New York. Some of those drugs merely extend life expectancy for a matter of months.

Contradicting a core lesson of Econ 101, competition among specialty drugs hasn't curbed prices, as manufacturers tend to match one another's increases. In the 1990s, multiple sclerosis drugs generally cost about $10,000 a year. As new MS treatments have hit the market, the prices of older ones have risen to the higher levels of newcomers, researchers reported in April in the journal *Neurology*. Today, all MS drugs cost $50,000 to $60,000 a year, or more.

It's into this environment that Gilead introduced Sovaldi at $1,000 a pill. Before December 2013, the company provided few clues it would charge so much, according to Miller of Express Scripts, which creates lists of covered drugs and co-payments and negotiates prices on behalf of employers and insurers. The benefits manager provides services for about 85 million individual members. Gilead's "choosing exactly $1,000 [a pill] makes it a lot harder to defend as a scientifically derived price," Miller asserts. The high price "took our [corporate] clients totally by surprise," he adds. "Here you have something that hits in the very last month of the year, and it is not in anyone's budget" for 2014. Hospitals and insurance companies were blindsided by the introduction of Sovaldi, which was "a case study of how not to collaborate," Betsy Nabel, president of Brigham and Women's Hospital, said at a conference in Boston in late April. Her institution hadn't planned for the stiff prices, she added, and that put pressure on the Massachusetts state Medicaid budget.

Some of the turmoil provoked by Sovaldi and Harvoni stems from their costs coming all at once. Many hepatitis C patients who weren't yet experiencing the worst symptoms had postponed treatment—some for years—based on the hope that drugs as good as Gilead's would eventually arrive. The pent-up demand caught everyone, including Gilead's management, by surprise. "It was an instantaneous shock to the system that managed care had difficulty absorbing," says Milligan.

And unlike drugs for HIV and most other chronic diseases, which patients take and pay for over decades, the bill for the Gilead hepatitis C medicines comes due almost immediately. Gilead's Alton compares paying for AIDS treatment to carrying a mortgage, while paying for Sovaldi or Harvoni is more like buying a house with cash.

Four days after the FDA approved Sovaldi, Miller told Bloomberg News that as soon as rivals introduced roughly comparable hepatitis C remedies, Express Scripts would favor less expensive alternatives. "We will identify which drugs can be pitted against each other and make some really tough formulary decisions," he said.

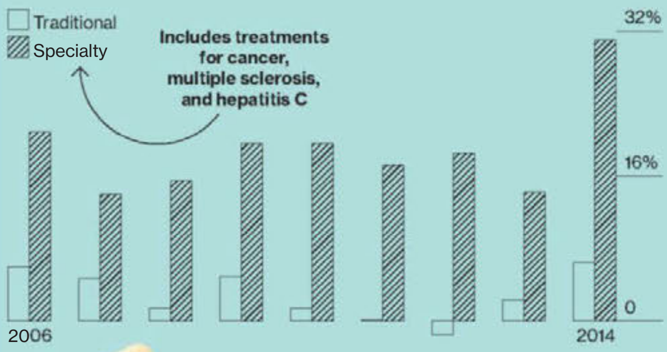
Gilead executives say they gave the industry plenty of notice about Sovaldi's pricing, including in the press release that announced its approval by the FDA. Once hostilities erupted in 2014, however, Milligan concedes, "We weren't quite sure how to respond to Express Scripts. They were out there beating the drum every day." Martin still refuses to engage directly: "I'm not going to comment on a specific company," the CEO says.

By November 2014, Harvard's Center for Health Law and Policy Innovation had found that 27 state Medicaid plans had restricted access to Sovaldi to patients with severe liver ailments, while some states also instituted limits on access for people with recent substance abuse problems. Milligan responded to the mounting unease at Sovaldi's $84,000 price tag during a symposium at the Brookings Institution in Washington. The company, he said, charged what it thought the market would bear. "We looked very hard at what value we were bringing to the system," he explained, "but at the end of the day, the pricing analysis was relatively simple: What is the current cost of other therapies?" He continued: "We were providing more value, better outcomes, shorter duration, better patient experience at the same cost as the standard of care."

Others at the Brookings event saw things differently. Sam Nussbaum, executive vice president for clinical health policy at Anthem, described Gilead's pricing strategy as contributing to "a race to the top," which was no compliment. "Is this trend of ever-increasing, more expensive medicines and increasing health-care costs sustainable for individuals and for our nation?" he asked.

The Rise of High-End Drugs

Percentage change in annual spending on pharmaceuticals*



*AMONG CONSUMERS WHO RECEIVE DRUG BENEFITS THROUGH EXPRESS SCRIPTS
DATA: EXPRESS SCRIPTS

In December, Express Scripts followed through on its threat to exclude Gilead's Harvoni from its main list of covered drugs, beginning on Jan. 1. Express Scripts said it would allow coverage only for a competing hepatitis C medicine, Viekira Pak, developed by the North Chicago (Ill.)-based AbbVie. Twelve weeks of Viekira Pak goes for $83,319, but the biotech company offered a "significant discount" in exchange for exclusivity, Express Scripts said.

Gilead privately offered a less substantial single-digit percentage discount, according to Miller of Express Scripts. "This is exactly what our plan sponsors hire us to do—negotiate and try to make drugs more affordable," he says. "We look at this as being the first of what will happen in the field of cancer, rheumatoid arthritis, and many other expensive specialty fields."

In January, Gilead cut its own confidential discount deal with CVS Health, the No. 2 pharmacy benefits manager, which agreed to offer Sovaldi and Harvoni to the exclusion of AbbVie's drug. Moreover, Gilead said that overall it would offer average discounts of 46 percent in the U.S. in 2015—including breaks given to government programs for veterans, the poor, and other groups—compared with 22 percent last year. Sales for Sovaldi and Harvoni have continued to exceed Wall Street expectations. On April 30 the company reported combined hepatitis C drug revenue of $4.6 billion for just the first quarter of 2015, double that of the year-earlier period. (By comparison, AbbVie reported first-quarter sales of $231 million for Viekira Pak.) Some 90,000 patients in the U.S. and Europe started treatment on Sovaldi or Harvoni during the first three months of 2015. For all of 2015, Gilead raised its sales projection for all drugs to $28 billion to $29 billion, from its previous projection of $26 billion to $27 billion.

Martin makes no apology for excellent financial performance. He notes that he's received hundreds of personal letters from grateful hepatitis C patients, and "the medical community is very, very supportive of what we're doing."

No one, in fact, disputes the long-term public health benefits of wiping out hepatitis C—which Gilead's drugs have the potential to do, if enough patients can get access to them. But the idiosyncratic nature of the U.S. health-care system means that the costs won't be rationally apportioned.

In an increasingly fluid job market, more workers move from one insurance plan to the next as they shift employers. Medicaid beneficiaries move on and off the public program, depending on their circumstances. At 65, many people leave the commercial insurance market as they become eligible for Medicare. As a result, one insurance payer may face a daunting bill for hepatitis C today, the benefits of which—hospitalizations and surgeries avoided—accrue to society over the patient's lifetime.

Gilead has established a variety of programs to subsidize uninsured patients and those with policies who can't afford their co-payments. The company has also followed the pattern it set with HIV drugs and introduced discount tiered pricing overseas and a licensing program enabling Indian generics manufacturers to make low-cost versions of hepatitis C drugs. But Gilead executives acknowledge that these partial steps to lower prices won't reach all patients if paying institutions such as Medicaid and Anthem impose reimbursement restrictions. American society needs to make tough choices, Milligan says. "It's not up to Gilead to forward that conversation," he says. "It's up to public policymakers to forward that conversation."

This kind of analysis offers little solace to Andre, the West Hollywood book editor suing Anthem for denying her reimbursement for Harvoni. "This is madness," she says. "It is like telling someone with breast cancer you have to wait until Stage 3 cancer before you can get treatment." Gilead's executives agree. What's less certain is whether the U.S. can afford the bills. B

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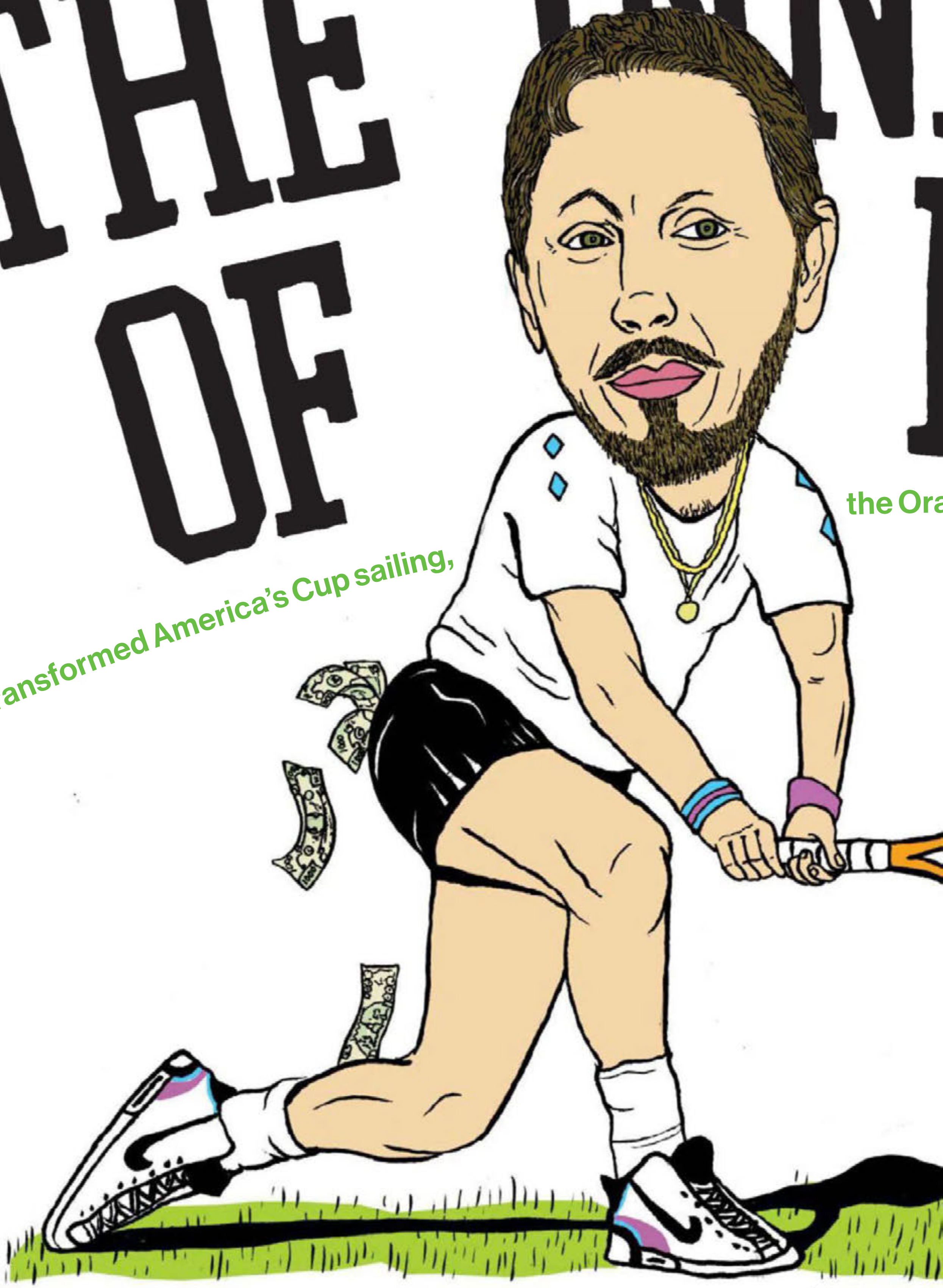


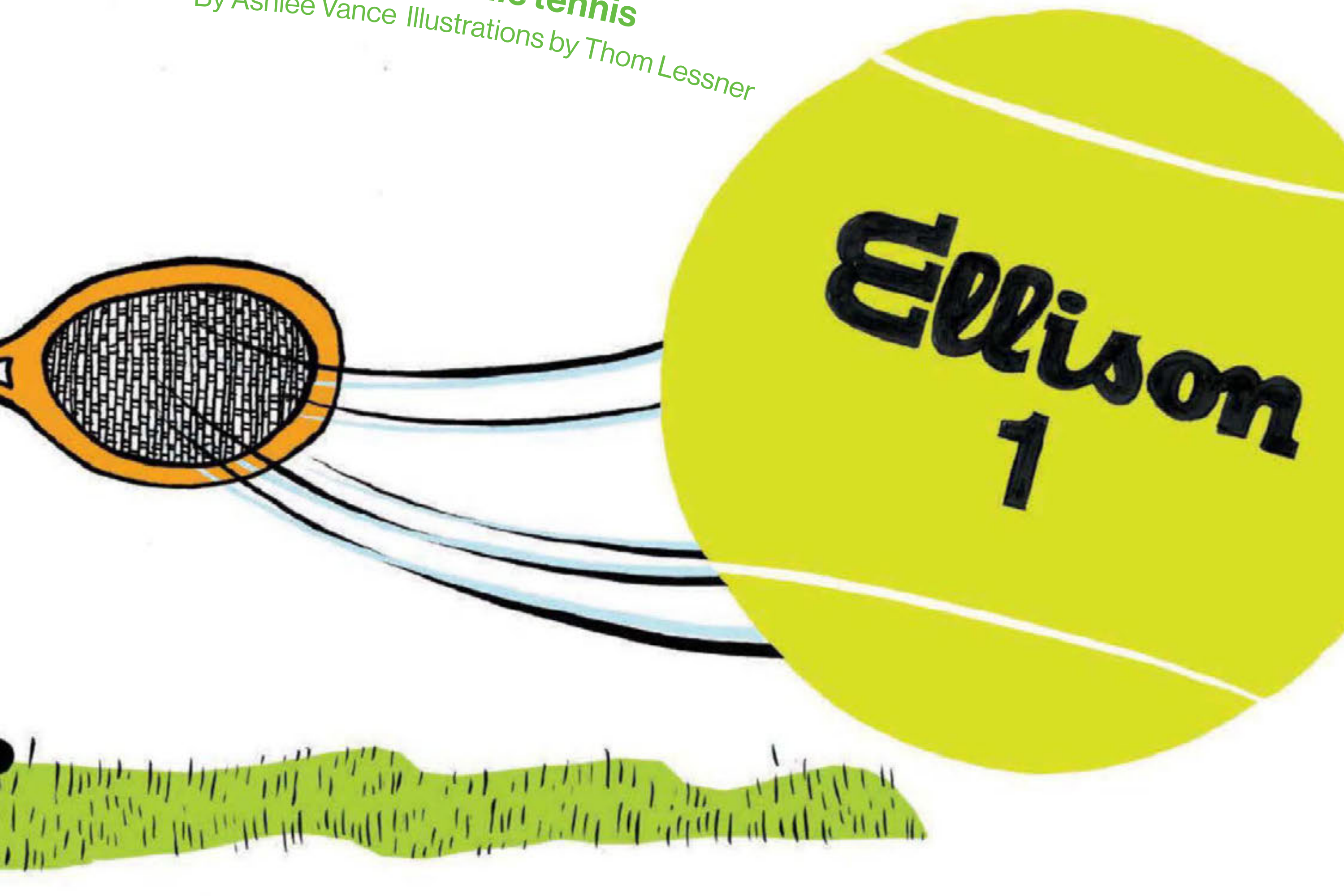
Having transformed America's Cup sailing,

the Ora

ER GAME
LARRY

acle billionaire now wants to rule tennis

By Ashlee Vance Illustrations by Thom Lessner



Amid a devastating drought, the Southern California town of Indian Wells seems like it should perhaps be illegal. Left alone, the ground here is baked and cracked and the same color brown as the barren mountains that surround this enclave of 5,000, many of whom are wealthy, white, and retired. But there aren't that many spots where the ground remains in its natural state. Indian Wells is a vacation paradise full of resorts with luscious green golf courses, vibrant flower gardens, and abundant pools. Some resorts even have sandy beach wading areas for the grandchildren. The weather is perfect eight months of the year.

In 2011, Larry Ellison, co-founder of Oracle, paid $43 million for Porcupine Creek, a 249-acre estate here. Visitors sign a nondisclosure agreement to get past the armed guard and front gate. Once inside, they find an exquisitely maintained 18-hole golf course decorated with sculptures of naked women lounging among pink and purple tropical flowers, a "slide-tacular" pool, and a Bellagio-worthy fountain that shoots water into the air when cars approach. These diversions surround a 27-room residence reminiscent of an Italian villa. Each year, Ellison's architect adds another signature feature to the estate to keep him from getting bored.

Ellison comes to Porcupine Creek for at least two weeks in mid-March to take in the BNP Paribas Open tennis tournament at the Indian Wells Tennis Garden, 20 minutes away. Ellison is worth an estimated $47 billion, making him the world's seventh-wealthiest person. He bought the tournament and its facilities for $100 million in 2009 and since then has invested another $100 million, improving the event year-after-year. Indian Wells, as it's commonly known, has become one of the world's premier tennis venues, attracting top players from both the men's and women's professional tours and, this March, 456,000 fans. That's more than will attend the French Open, which ends on June 7, and rivals the draw of Wimbledon. It's been dubbed the "fifth Grand Slam" and has become the model of how a tournament can be profitable while offering lavish perks to players and fans.

"It is so important for the tour to have someone like Larry buying a big tournament and pushing the other events," says Rafael Nadal, a three-time winner at Indian Wells, shortly after losing to Milos Raonic in the quarterfinals this year. Nadal stays at Porcupine Creek as Ellison's guest during the tournament. The estate has three tennis courts nestled into a grassy knoll with butlers on call from a central cabana to serve espresso, Champagne, or, as Nadal prefers, chilled coconut water. The cabana could be Nadal's second home: Scores of his rackets fill a floor-to-ceiling locker; photographs of his trophy presentations dot the walls. "What Larry is making is amazing," he says.

Other players show up to enjoy the splendor of Ellison's estate, too, including Novak Djokovic, the current top-ranked male tennis player, and Roger Federer, his competition in the Indian Wells final this March. "Novak coming over and playing golf and joining us for dinner with his lovely new wife and baby is great," Ellison says. "Roger's kids are always here going down the water slide. And I don't think there is a nicer person on the planet than his wife, Mirka." Things get so clubby at Porcupine Creek that Ellison has to work to keep the rivals from running into each other at dinner or in the fitness center. "These guys like one another and respect each other, but they're competitors, and they want to beat each other," says Ellison. "There's got to be a certain amount of separation."

During a weeklong visit to the stadium and Porcupine Creek, it became clear that on the strength of Indian Wells, Ellison isn't content with adding a fifth Grand Slam to the pro tour. With help from Mark Hurd, Oracle's co-CEO and fellow tennis aficionado, he wants to restore tennis to prominence in the U.S., and make the game more profitable globally. "I think we simply have to do something to improve the quality of American tennis," Ellison says, sounding for a moment like someone determined to end malaria. To do that, he and Hurd are plotting an all-new American tennis tour, and they want to cultivate the next Andre Agassi and Pete Sampras. Around Indian Wells, meanwhile, there are plans to build for tennis fans what Las Vegas is for gamblers. "I wouldn't call Indian Wells a competitor to Monaco just yet, but the desert is changing," Ellison says. "And why not? We should compete in all of these dimensions."

TOP: DREW CARLISLE/BNP PARIBAS OPEN

THE "FIFTH GRAND SLAM"

1974
Founded in Tucson by former tennis pros Charlie Pasarell (Puerto Rico) and Raymond Moore (South Africa)

1976
Moves to Palm Springs. American Airlines is its sponsor, and **Jimmy Connors** is champ

1982
Yannick Noah ends Ivan Lendl's 44-match win streak

1987
Moves to Indian Wells and is renamed Newsweek Champions Cup

1995
Pete Sampras defeats Andre Agassi in the men's final

The Indian Wells Tennis Garden hosted 456,000 fans this year

Ellison, 70, has rebuilt a sport before. His love of sailing led him to his highly controversial domination of the America's Cup, the capstone to decades of exploits that have included brushes with death while sailing in the Pacific, the construction of a real estate empire in Malibu and Hawaii (where he owns 98 percent of the island of Lanai), and liaisons with far younger women, including current girlfriend Nikita Kahn, a young actress and model from Ukraine.

In the runup to the 2013 America's Cup in San Francisco, Ellison used his fortune and connections in technology to create the biggest, fastest yachts the world has ever seen. The result: two- and three-hulled boats that travel more than 50 miles per hour, pleasing spectators while putting the crews at risk. (A sailor on a competing entry died when a yacht capsized.) Ellison's team made unapproved changes to a practice boat and was penalized for cheating before completing one of the greatest comebacks in sailing history. While San Francisco officials had complained about the regatta's cost and impact on the city, spectators packed the waterfront and millions tuned in on TV and tracked the boats online. Encouraged by the success, Ellison wants to take smaller, safer boats and start a worldwide racing series. "We want to turn this into Formula One," he says. "We want to have regattas in Shanghai where they close down the Bund. We want to be in Tokyo Bay, in Auckland, Marseille, and Sicily racing these boats in big breezes."

Ellison took up tennis about a decade ago. The pickup basketball games that kept him in shape were grinding down his body. "You can only play with 22-year-olds and get your nose broken so many times before you look for a sport that is cardiovascularly demanding but without the broken bones," Ellison says. He plays tennis about five times a week now at his main residences in Malibu and Woodside, Calif. Most often, Ellison competes against Sandy Mayer and Trey Waltke, a pair of former pros.

Ellison attended Indian Wells as a guest of the owners a few times before hearing from Raymond Moore, a former player and investor in the tournament, that it might relocate overseas. In 2008, groups in Shanghai and Qatar had put together lucrative offers. (Event owners basically control a specified date for holding a tournament and can sell those rights.) Moore reached out to Ellison to see if he might bid to keep the tournament in California. Ellison obliged. "I thought it was inexpensive in terms of its value," Ellison says of the $100 million he plunked down in 2009.

Ellison has advanced Indian Wells at a furious pace. It's the only event to have the automated—and costly—Hawk-Eye line-calling system on every court. Players are treated to gourmet food and spacious training facilities. "Everything here is Grand Slam level," says Tim Smyczek, a 27-year-old American player. Ellison has built stands around the practice courts—a move the United States Tennis Association has since copied at the US Open—and built out large shaded park areas with water misters and bars. "For me, Indian Wells is the best two weeks of the year," Nadal says.

In 2013, Ellison decided to create an 8,000-seat venue to complement the existing main 16,000-person stadium. Minutes after that year's final, bulldozers began grading the desert dunes. Ten months and 10 days later, the court was ready. It has three world-class restaurants overlooking the courts, including a Nobu that's open only for the two weeks of the tournament. "I am sure we have the best sports stadium food of any stadium on the planet earth," Ellison says. He didn't want people parking in remote lots, so he purchased dozens of acres of land surrounding the center and turned them into grassy parking lots.

Most provocatively, Ellison has been boosting the prize money. To the horror of frugal tournament owners around the globe, Ellison has raised the payouts from $7 million to $11 million. "The other tournament

2000
Indian Wells opens world's second-largest tennis stadium, part of a $77 million complex built with help from sports agency IMG's founder, Mark McCormack, and its then-president, Bob Kain

2001
Agassi beats Sampras, avenging the 1995 final

2001
Venus Williams cancels a match with sister Serena, who is booed while winning the final. Their father and coach, Richard, accuses the crowd of racism. Both players begin a boycott

2006
Sampras, Billie Jean King, and Chris Evert buy out IMG's stake

2009
Ellison purchases the facilities and tournament for $100 million; BNP Paribas buys naming rights

2010
Ivan Ljubicic beats Andy Roddick in the men's final, winning **$7,020,280**

2015
Novak Djokovic defeats Roger Federer in men's singles, winning **$10,762,466**

2015
Serena Williams returns after 14 years

PLAYERS: AP PHOTO (4); POPPERFOTO/GETTY IMAGES (1)

directors are not that happy to see such a steep increase," says Tommy Haas, a German player once ranked No. 2 in the world. Some players tried to block the prize money increases because Ellison wanted to give a higher percentage of the earnings to the top singles players rather than lower-ranked grunts and doubles players, even though everyone would still have made more money than in previous years. "There's always going to be a tension of people saying the people getting paid the most are getting paid too much," says Ellison, one of the highest-paid executives in the world. "I think this is something we see in all aspects of society. We hope we can come to a reasonable compromise where obviously the stars are going to keep making a lot of money, but where we also make sure the other players can make a good living as well."

Many in professional tennis say Ellison may be just the sort of shrewd risk taker the sport needs. Tennis is unusual in that it has no central ruling body; instead, a half-dozen or so organizations control how it evolves. The men's tour and women's tour, for example, are separate, with separate sponsors, marketing, and TV deals. Tennis officials have run calculations that suggest the industry could bring in five times more revenue under a combined regime, but the last time such an idea was proposed some of the top male players drew a sexist line in the sand. They did not want to do business alongside the women.

"We have monetized tennis to only a single-digit percentage point of where it should be," says Steve Bellamy, who runs several tennis clubs and has been a longtime advocate for change in the business. "It's all one big political hairball."

To shake things up further, Ellison has at least considered buying the Tennis Channel. "I was in negotiations, but we were wildly far away on price," he says. Even so, Ken Solomon, CEO of the Tennis Channel, got excited. "For things to change, you need someone with enough money and a long-term view," Solomon says. "I think maybe Larry is the guy to do this."

During the second week of the Indian Wells tournament this March, the tennis cabana at Club Ellison becomes a strategic conference. A glistening Nadal comes in from the practice court to meditate on the future of the sport. Then Haas, wearing a white tennis ensemble and a baseball cap, holds a tête-à-tête with Hurd. All agree that tennis—both the quality of play, sponsorship, and broader financial growth—would be well served by the emergence of a major American male star in the tradition of Jimmy Connors, John McEnroe, Pete Sampras, or Andre Agassi. "We need the U.S. game," says Nadal. "We hope the U.S. players will come back to the top positions."

"Tennis is just not at the forefront like it used to be," says Paul Goldstein, a former player and the head coach at Stanford University. "There are on the order of 20,000 kids playing in tennis tournaments, and when you look at those numbers compared to where youth soccer is at, it's disturbing."

Unlike Ellison, Hurd played tennis throughout his youth. He was good enough to earn a full ride to Baylor and to play No. 1 for the team. Without any prodding at all, Hurd will pull out trophies earned at National Collegiate Athletic Association Division I championships. "You would never have seen one of these," he says, knowing that I managed to play only Division III tennis. When the Indian Wells tournament is on, Hurd flies down from Oracle's headquarters to mix business and pleasure. He speaks with customers and takes in the matches. He also plays at Porcupine Creek and can be found showing off his guns in a tank top.

According to Hurd, any revival of U.S. tennis will start with the NCAA. He's been a major donor to Baylor's tennis team and says that, as with football and basketball, universities can become a kind of minor league for the pro tour. Because of advances in string technology and improved fitness levels, players must now be prepared to spend three, four, and five hours on the court bashing balls with all their might in long rallies. As a result, 18-year-olds now rarely win Grand Slams the way young stars of yesteryear did. These days, players hit their prime at around 25. The change has made collegiate tennis a more attractive option for future pros. The athletes can develop their games on a university's dime and get an education instead of spending a minimum of $60,000 a year of their own money traveling the world and working their way up tennis's ladder.

Oracle last month became the lead sponsor for the Intercollegiate Tennis Association and has put its money behind a couple of major college tournaments—one at Indian Wells and another at Ellison's club in Malibu. A new American circuit might start with a midlevel pro tournament in Los Angeles that would take place a couple of weeks before Indian Wells. Then, leading up to both events, there would be a series of 8 to 12 minor-league tennis tournaments played throughout the U.S. College players would be allotted a set number of slots in these tournaments to provide a tryout of sorts. "Either Oracle is going to sponsor it, or I am going to do it," Ellison promises. He and Haas may also go in together on a junior tennis academy in California.

Despite a few tries, Ellison hasn't been able to get his hands on a sports team, in part because other owners have blocked him. "I could have bought the [Golden State] Warriors," he says. "But I know for a fact that there was concern that I was a person who wanted to win all the time and that I would raise the prices for coaches and facilities and all sorts of other things and make it much more expensive for all the other teams to compete," he says. "You know, on Tuesday I'd love to own an NFL team and I'd love to own an NBA team both. And then by Thursday I'm really glad that I don't own an NBA team or NFL team, because there's a lot going on in my life."

Kahn and Ellison take in a match in March with McEnroe and Bill Gates

Ellison has plans for a third showcase stadium that will also have the world's best tennis museum. "We have objects going all the way back to Elizabethan times, when tennis was played in front of the queen," says Ellison. At the grandstand stadium, he plans to unveil a president's box next year. It will be a special seating area for celebrities, accessed via a private entrance. Ellison is modeling the idea on the Royal Box at Wimbledon, where actors such as Bradley Cooper take in matches.

"If it sounds elitist, I'm sorry," Ellison says. "But, if we want celebrities to come to the tournament, we have to provide them with security and privacy. Having those people there is going to make it more interesting for the television audience and more interesting for the other fans. A die-hard middle-class fan will have a great time, and so will Bradley Cooper." B

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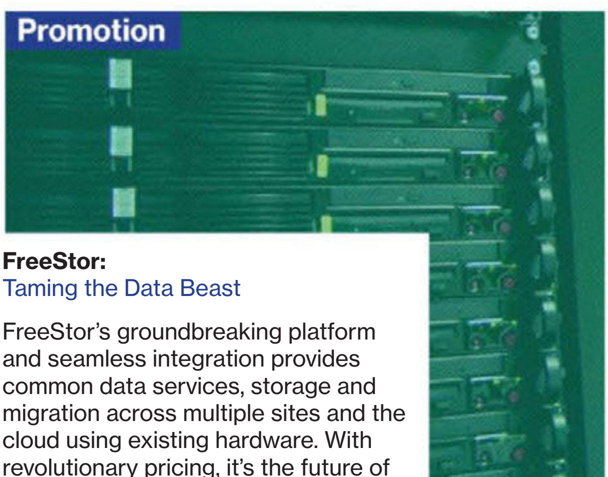

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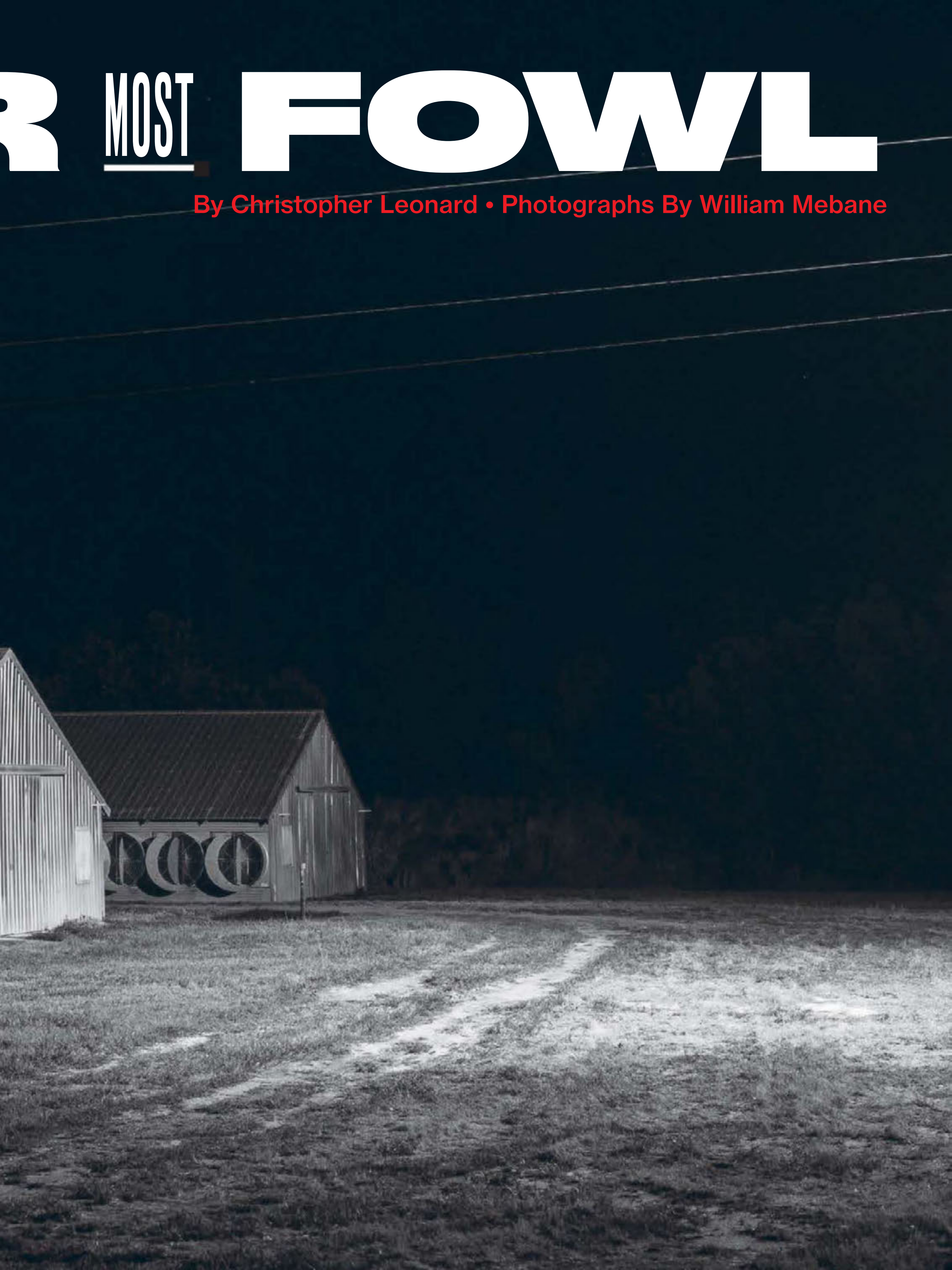
MURDER

Who's killing the chickens of Clarendon County?



R MOST FOWL

By Christopher Leonard • Photographs By William Mebane

The chicken farm on Brewer Road, just south of the small town of Manning in South Carolina, is hidden away down a series of winding country highways, between a patch of forest and an empty farm field. On the morning of Feb. 17 the farm's owner, a Vietnamese immigrant named Hoangson Nguyen, was awakened by a frantic phone call. Nguyen, who goes by "Sonny," raises birds under contract for Pilgrim's Pride, the nation's second-largest poultry company. An employee who checks the chicken houses each morning was shouting over the phone. Something was terribly wrong.

Nguyen sped to the farm. That morning, when the farmhand opened the door to the first building, a sophisticated warehouse designed to hold about 20,000 birds, a column of steam had billowed out. Nguyen went into the control room and saw that the temperature inside was 122F. He entered the cavernous building. It was like a sauna: The giant circular fans used to cool the chicken house had been switched off. A set of electronic alarms had also been disabled. There were thousands of dead chickens on the ground, pressed up against the walls as if they'd tried to escape. They'd been smothered to death overnight in the intense heat. Nguyen knew immediately that this wasn't an accident. Someone had killed his flock.

Nguyen is a typical chicken farmer: He owes the bank about $2 million for his farm, and he doesn't have enough money for health insurance. He lives paycheck-to-paycheck, or "flock-to-flock," as they say in the business. The moment he saw the dead birds, Nguyen knew he wouldn't make any money this year. Whoever had killed these birds might very well have killed his farm. "I fell down right in front of the door," he says. "I almost passed out."

Nguyen's farm wasn't the only one hit that night. Three others also had their control systems sabotaged, killing the birds inside. Over the next week about 320,000 chickens died in attacks on farms throughout Clarendon County, in what appears to be the largest crime against industrial poultry farms in U.S. history. All the birds were owned by Pilgrim's, which pays Nguyen and other farmers to raise the animals.

The dead birds were worth about $1.7 million to Pilgrim's, but it was the farmers who suffered the most financially from the attacks. Each lost about $10,000 for every house of chickens killed. For people living flock-to-flock, it was a potentially ruinous blow, and one that can be understood only within the peculiar and brutal economics of chicken farming. Companies such as Pilgrim's force contract farmers to compete against one another for their pay. One farmer's bonus is taken directly from his neighbor's paycheck.

To police, this detail suggested a possible motive. Based on the highly precise manner in which the farms had been targeted and their poultry slaughtered, investigators quickly concluded that whoever was behind the attacks was intimately familiar with chicken farming. Within days of the midnight massacre, it became clear Nguyen and the others had been victimized by one of their own—a fellow farmer who'd come to see his neighbors, and their flocks, as the enemy.

Sheriff Randy Garrett is the top lawman in Clarendon County. Garrett is more than 6 feet tall, with wide shoulders and piercing blue eyes. He uses a cane—he's recovering from a recent car accident—but even with a pronounced limp he fills the room with his imposing presence when he walks in. In June he's celebrating his 41st year on the force.

Chicken houses targeted in the February attacks typically held 20,000 to 30,000 birds

On Feb. 17, as Garrett's deputies fielded calls from farmers who woke up to find their flocks had been killed, they learned that the attacker used different methods of slaughter. Full-grown birds like those on Nguyen's farm were cooked to death. In farms that had baby chicks, which need high temperatures to simulate a brooding nest, the saboteur cut the heat. The chicks froze to death, piling up in a futile effort to stay warm and smothering those at the bottom of the heap.

Then there were the alarms. Chicken houses are equipped with a variety of systems to alert farmers when machinery malfunctions; things can go wrong quickly when a house is crowded with 20,000 or 30,000 birds. Whoever disabled the alarms understood the farmers' different systems, so no one was notified.

Pilgrim's Pride is owned by the Brazilian meatpacking conglomerate JBS, one of the largest meat companies in the world. Pilgrim's, which reported $8.6 billion in revenue last year, does business with more than 4,000 contract farmers in the U.S. and Mexico. The farmers in Clarendon County all raise birds for a Pilgrim's processing plant in Sumter, S.C. "We knew from the start that it had to be somebody that was disgruntled, mad, upset with Pilgrim's," Garrett says. "This is not somebody just riding by [who] just randomly said: 'You know, I'm going to create havoc a little bit and go kill me some birds.' ... You had to have inside knowledge."

Garrett got a crash course on the confusing structure of modern poultry farming. Here's how it works: A farmer such as Nguyen borrows money to build a farm. Then he signs a contract with a company like Pilgrim's, which is called an "integrator" because it owns virtually every aspect of production, including hatcheries, feed mills, slaughterhouses, and trucking lines—everything but the chicken houses and the land they stand on. The integrators deliver the chickens, bring the feed, and even provide medicine for the birds if needed. The farmer's job is to baby-sit the animals and make sure the heating and feeding systems are working. After about six weeks or so, the integrator picks the birds up for slaughter, sending the farmer a paycheck for his work.

In the eyes of the law, Pilgrim's Pride was the primary victim of the chicken house attacks because it owned the birds. But Pilgrim's wasn't like any crime victim Garrett had dealt with before. He quickly found himself tangling with a corporate bureaucracy that stretched from South Carolina to Greeley, Colo., the U.S. headquarters for JBS. On Feb. 17, Garrett arranged a meeting with Darren Bolton, who oversees farming operations at the Pilgrim's Sumter plant. They sat down in a conference room at the sheriff's office, where Garrett laid out his theory of the case: Pilgrim's was likely attacked by an angry employee. He asked Bolton if Pilgrim's had recently fired anyone or performed layoffs. Could he think of anyone who might have a grudge? Garrett says Bolton told him he couldn't think of anyone.

The chicken industry's system for compensating farmers, however, is explicitly designed to punish those who underperform their peers—a recipe for resentment and grievance.

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MAD, UPSET WITH PILGRIM'S... YOU HAD TO HAVE INS

Other farmers get paid a certain price per pound or bushel for the commodity they raise; chicken farmers are paid in a system known as a tournament.

The tournament, like so much in the chicken business, is controlled by the integrators. When a group of farms delivers birds to a Pilgrim's slaughterhouse, the company gathers them into a tournament pool. Then it tallies how fat each farmer's birds got and how much feed the animals ate. Pilgrim's crunches those numbers to arrive at a figure that measures "feed conversion," or how much weight the birds were able to gain based on the feed rations Pilgrim's provided. The company ranks each farm's feed conversion against the others. Farmers who rank at the top get a bonus; farmers at the bottom get a pay cut.

The farmers, however, don't control the main factors that determine success in the tournament, which are the health of the baby chicks and the quality of feed the integrator delivers. For this reason, the tournament feels more like a lottery, with farmers praying for healthy birds. And it's a zero-sum game: The bonus for the top farmer is taken from the paycheck of the bottom one. The feed conversion gap between top- and bottom-performing farms is often small, but the penalty can be large. A recent tournament sheet for a Pilgrim's farmer in the Sumter area shows a difference in feed conversion between the top and bottom farm of just 3.6 percent, but the pay difference between them was 10.2 percent. Placing at the top or the bottom of the tournament can mean the difference between profit and bankruptcy.

AS DISGRUNTLED,
SIDE KNOWLEDGE"

By discouraging collaboration and partnership, the system has a chilling effect on farmers' relationships. Nguyen says when Pilgrim's farmers attend group meetings at the Sumter plant to get the latest news and updates from company officials, they tend to sit in stony silence.

Among the regular participants in these meetings was a farmer named James Lowery, a skinny man with close-cropped brown hair and glasses that make him look like a bookish accountant. He kept to himself, never exchanging words with Nguyen. Farmers interviewed by Garrett's investigators said Lowery was having problems with Pilgrim's, and the company wasn't going to renew his contract. Garrett called Bolton and a few of his co-workers back to the sheriff's office and asked them if they'd cut ties with Lowery or any other farmer.

They said, "'Well, we didn't fire this guy. We just didn't renew his contract,'" Garrett recalls, with obvious exasperation. "I said: 'OK, buddy, let's rearrange this sentence. Do you see what I'm saying here? You didn't renew the contract. It's the same thing. You let him go. You're not doing business with him anymore.'" Pilgrim's spokesman Cameron Bruett says Bolton and the other company representatives weren't trying to mislead Garrett.

As it turns out, Lowery was familiar to Garrett and his deputies. In September 2014, the farmer had been charged in Sumter with disorderly conduct in a case that's still pending. Garrett had a lead but not much more. Meanwhile, the killings continued.

Lowery is from a locally well-known family. His father, Robert, founded Lowery Heating & Air, a residential HVAC company in Sumter. The company has about $2 million in annual sales, according to its website, which also says that James, his father, and his brother all work there. (Lowery didn't return several messages seeking comment; his attorney also refused to comment for this story.) Lowery got into the poultry business around the

A message to intruders at Raymond Wells's chicken farm

year 2000, Bruett says, and tended to perform in "the middle third" of the tournament pools. Pilgrim's had sent Lowery letters in the past asking him to address problems on his farm related to biosecurity and neighbor complaints, Bruett adds.

In mid-2013, First Citizens Bank & Trust filed foreclosure papers on property Lowery owned, though it's unclear if that property included his poultry farm. In December 2014, after Pilgrim's delivered a flock of birds to his farm, Lowery neglected the flock to such an alarming degree that Pilgrim's determined he'd violated the company's animal welfare policies, Bruett says.

Pilgrim's sent Lowery two certified letters, one in December and the second in January, telling him he needed to address several problems on his farm, but Lowery never addressed the complaints, Bruett says. In late January, Lowery was sent yet another certified letter, informing him he was violating Pilgrim's animal welfare policies. On Feb. 16, Pilgrim's began an internal review to determine if Lowery's contract should be canceled. That night, the first attack on the chicken houses occurred.

Garrett says officers interviewed Lowery on the second day of the investigation. He cooperated and "played kind of cool," Garrett says. The investigators had no evidence with which to charge him.

On the night of Feb. 20, two more farms were attacked. On one, the attacker tampered with controls at four chicken houses and killed all the birds inside, about $320,000 worth of poultry. The next night, another farm was attacked, this time with two houses sabotaged. A week after the first attacks, Garrett didn't appear any closer to making an arrest, and farmers grew nervous. The sheriff posted armed deputies at Pilgrim's farms at night. Farmers carried guns when they went through the houses. "If I caught somebody here on my farm, I would have shot first and asked questions later," says Pilgrim's Pride farmer Raymond Wells. He had trouble sleeping at night, knowing that his chicken houses were vulnerable. Wells always keeps a pistol in his glove compartment, but during the attacks he also stowed a Ruger Mini-14 semiautomatic rifle in his truck.

Lowery

Nguyen began to carry a gun with him whenever he worked on the farm. He was consumed with anger and stress. The costs of the attack kept growing. He had to dispose of about 40,000 dead chickens, but he couldn't bury them outside because his farm is surrounded by environmentally sensitive wetlands. Instead he dug a long trench in the earthen floor of two of his empty chicken houses and piled the birds into the grave-like pits, covering them with dirt and chicken litter. Pilgrim's said it would deliver new birds once the chickens had decomposed completely. In the weeks after the attack, Nguyen developed a painful growth in one eye. He consulted various doctors, paying out-of-pocket for each visit. He was eventually given medication for the condition, which a doctor said was stress-related.

Nguyen's problems got worse after Pilgrim's collected his remaining birds, those not killed in the attack. The company mailed him a tournament settlement sheet showing how he ranked for that flock: dead last. When calculating his performance, Pilgrim's had included the two houses of birds killed in the attack. This made his performance look terrible, as if 40,000 birds had died because of neglect, and it dragged down his pay

"IF I CAUG
I WOULD HAVE SHO

rate for the living birds. The settlement sheet said Nguyen's "performance pay" was a deduction of $12,961.61. He saw it as a second financial punishment for the attack.

Bruett says Nguyen's settlement sheet, while ranking him at the bottom, is misleading. His pay was subsidized by a special minimum payment rate, called an "act of God" provision, which helped compensate Nguyen for the attacks. Bruett says the fee didn't cover all the costs. "I look at that, unfortunately, as the [sabotage] demerit,'" he says. "That's what the sabotage cost you."

On Feb. 24 the saboteur struck again. It was the most devastating attack yet. Someone tampered with the controls of eight chicken houses owned by a farmer named W.L. "Mutt" Coker. All the chickens died, a financial loss totaling about $640,000. Coker says he spent an additional $100,000 to clean up the mess, burying thousands of dead birds in crop fields he owns.

By the end of February, Garrett's investigation seemed to be stalled. He says Pilgrim's continued to evade his questions throughout February and March and was slow in providing information he requested. During a news conference about the attacks, Garrett mentioned that Pilgrim's had recently laid off dozens of workers. Bruett contradicted Garrett in the press, telling the *Meatingplace* trade magazine that the company hadn't cut any jobs. Bruett later said that the statement was a mistake and that he made it because he wasn't aware of layoffs that occurred in December.

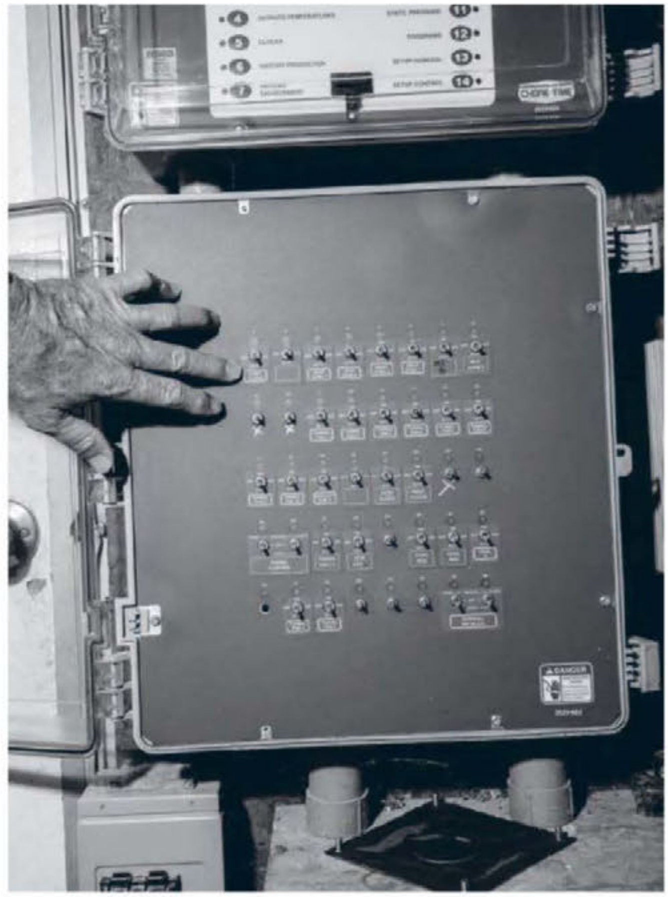
Then Garrett got a break. Earlier in the investigation, he'd sought a court order to obtain Lowery's cell phone records. In early April they arrived. According to Garrett, they placed Lowery at the site of every farm that was hit at the time of every attack. The farms were all in remote locations, some of them miles from the nearest main road. This location data seemed beyond coincidental and was bolstered further, Garrett says, by text messages and phone calls Lowery had made. The communications traffic would make it difficult for Lowery to argue that someone had taken his phone and then committed the attacks without his knowledge.

Chris DuRant, the local state prosecutor, agreed the location evidence was convincing. "The properties were hit during the middle of the night, which I think makes [the evidence] stronger," DuRant says. "It's not like he was just driving by the properties in broad daylight."

Garrett's deputies went to Lowery's house on April 7. The sheriff says they found him sitting in a vehicle and arrested him without incident. Lowery was charged with eight counts of burglary and three counts of malicious injury to animals or property.

At Lowery's first bond hearing in April, his defense lawyer, Chip McMillan, said the case against his client was "based entirely on suspicion." A Clarendon County judge threw out the charges against Lowery at a preliminary hearing on May 12, ruling that prosecutors hadn't presented sufficient evidence to take the case to trial. While the phone records put Lowery's phone at the scene of each attack, the investigators hadn't presented fingerprints, tire tracks, or other forensic evidence.

County prosecutors are still pushing the case. Solicitor Ernest Finney told the *Manning Times* that he'll put it before a local grand jury, which would determine whether the evidence against Lowery is strong enough to support an indictment. Garrett says Lowery's legal troubles might be just beginning. Federal investigators are looking into the case and could charge him with tampering with the food supply, according to Garrett, a felony that



CLARENDON COUNTY DETENTION CENTER

Temperature systems that had been tampered with proved fatal

carries 20 years per count. In all, law enforcement officials suspect Lowery of attacking the eight farms in Clarendon County and one in adjacent Sumter County.

Regardless of the outcome of these investigations, the case raises questions about the tournament system, which may be fueling desperation among farmers. The Obama administration tried to ban the system in 2010 as part of a broader antitrust effort against meat companies. The U.S. Department of Agriculture proposed a rule that would give farmers a base pay level that couldn't be undercut by the tournament rankings. The companies would be able to offer bonuses but couldn't dock a farmer's pay for poor performance. Meat industry lobbyists kicked into high gear and ultimately persuaded Congress to defund the measure.

Garrett says the tournament system might well have led Lowery to blame his neighbors, not Pilgrim's Pride, for his problems. "They all know, 'The better I perform, the more money I make, the less the other guy [makes]. They didn't care about me when they were out outperforming me. So why should I care about them?'"

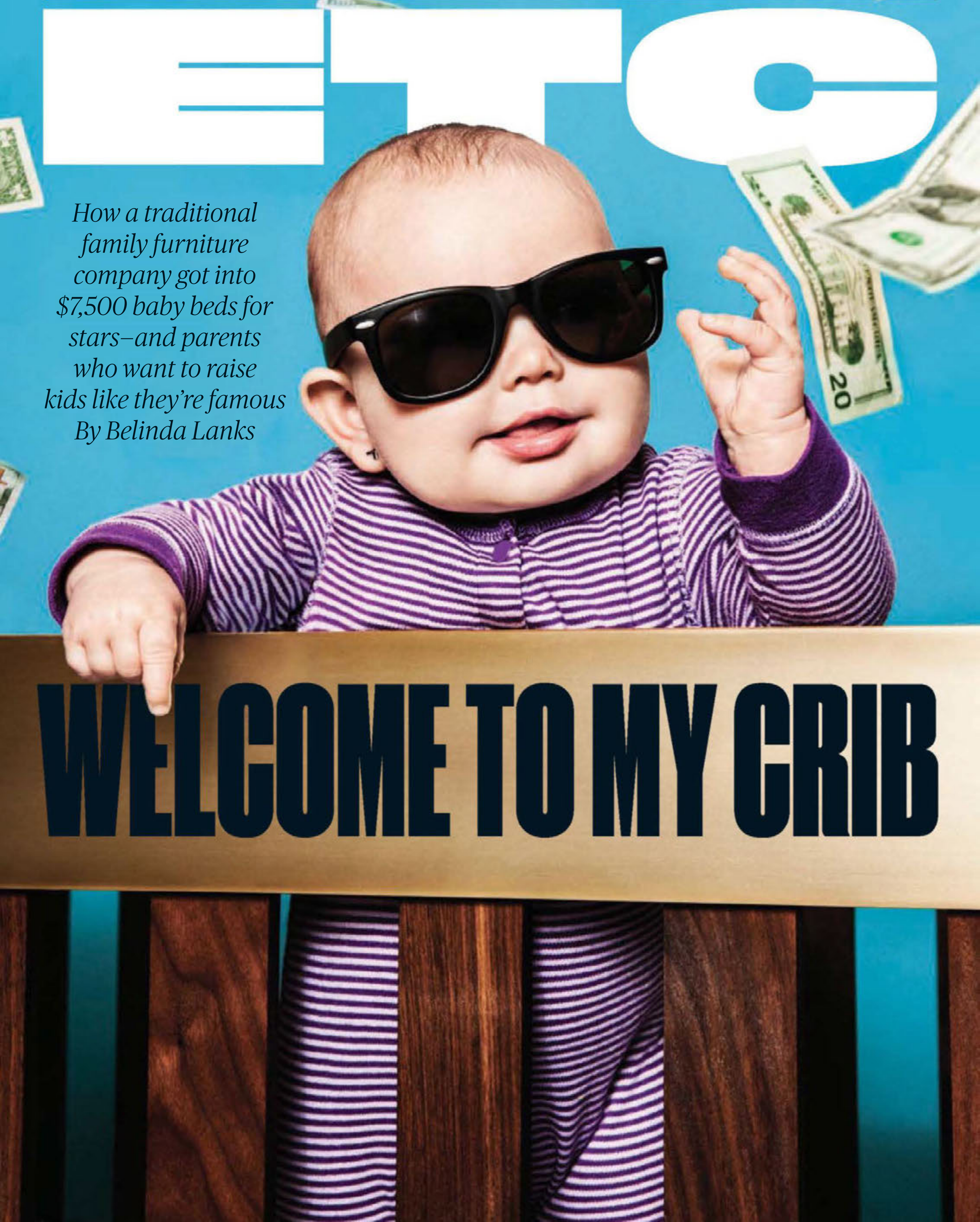
In April, after Lowery's arrest, Nguyen was hoping that Pilgrim's would soon deliver birds so he could start earning money to cover his massive shortfalls. He was negotiating payment on a heating bill for his farm and taking medicine to control his eye condition. He says the anger that consumed him in February has dissipated. "I feel sorry for James Lowery. I don't hate him at all." Ⓑ

GHT SOMEBODY HERE ON MY FARM,
OT FIRST AND ASKED QUESTIONS LATER"

WORST E-MAIL SIGNOFFS / DODGE THE **SUN** / ALL THE SAD, RICH **MOMS** / **ROCK** A SUMMER TIE

ETC

How a traditional family furniture company got into $7,500 baby beds for stars—and parents who want to raise kids like they're famous
By Belinda Lanks



WELCOME TO MY CRIB

At Bel Bambini, a nursery boutique in West Hollywood, Calif., a transparent acrylic crib rests prominently in the center of the showroom. It's the Vetro, a $4,500 ghost of a baby bed, which the store started stocking in 2011. Since then, Bel Bambini has sold more than 350 of them to wealthy parents—or their interior designers—most of whom saw it in tabloids or on reality TV after celebrities such as Robert Downey Jr., Beyoncé, and Kim Kardashian procured one for their offspring. (With the exception of Kardashian, the stars paid full price.) "You can always tell when a new celebrity gets it," says Ahzahdeh Neshat, the store's manager. "Suddenly, all these customers call and say, 'I want the clear crib.'"

The crib is made by Nursery Works, a high-end brand owned by L.A.-based Million Dollar Baby. The company, despite its name, has manufactured mostly inexpensive children's furnishings since 1990, when co-founder Daniel Fong began making the Jenny Lind, a classic $99 crib with a frame of carved wooden spindles. "That was the most popular style at the time," Fong says, so he needed to find a way to differentiate: Instead of shipping premade models from East Asia, MDB imported the wooden parts and assembled them to U.S. safety standards using better-quality domestic hardware and mattresses. Then he sold his Chinese-American hybrids to specialty stores. "I could tell the consumer, 'This crib has the same hardware as Child Craft and Simmons, but it costs half the price,'" he says. "That's my story."

For a decade that story held. The Jenny Lind became a top seller, and Fong decided to branch into slightly more expensive offerings. In 2000 he introduced the DaVinci brand, which was less basic. Then came Franklin & Ben, inspired by "turn-of-the-century" motifs. The various MDB lines were pretty much identical in price and style until the mid-aughts, when Fong's two children, Tracy and Teddy, graduated from Harvard and were wooed back west to join the family business. One of the kids' earliest hires was Tiffany Wong, Teddy's wife, who was brought on as marketing director to make the lines distinct from each other. Meanwhile, Tracy persuaded her dad to sell $200 cribs, $700 gliding chairs, and $900 dressers online at Amazon.com and Walmart.com. And Teddy went about building new lines, including the European-inspired Babyletto and Nursery Works, the luxury brand, which MDB acquired in 2010. In 2007 the first year after Fong's children joined, revenue more than tripled, to $35 million. Last year, it reached $50 million.

That constant stream of income gives the company freedom to focus on Nursery Works, which accounts for only 5 percent of MDB's sales but is considered by the family to be the company's greatest opportunity. Nicely made, nonimport children's furniture has struggled in the past decade. In 2014 alone, several midrange lines, including Kid Brands and Muniré, which makes sophisticated styles, filed for Chapter 11 protection. Others, including Stanley Furniture, stopped producing kids' pieces made of wood.

It's manufacturers like MDB—with dependable Chinese factories, flat-pack shipping, and cheap, disposable models—that first drew consumers away from artisanal, high-end furnishings for tykes. And yet Nursery Works is hoping to find profit in that exact sector, which its parent company blew wide open in terms of competition. As very rich babies such as North West, Blue Ivy, and Kate Middleton's royal spawn become stars in their own right to an unprecedented degree, it's a smart time to go upscale.

"When Nursery Works was first acquired, the promise of the brand was to showcase our ability to design," Wong says of the purchase for an undisclosed sum from Bexco Enterprises. The goal, she says, is "to elevate our current MDB brands while serving a different segment of the market."

THIS PAGE AND PREVIOUS: PHOTOGRAPHS BY STEPHANIE GONOT FOR BLOOMBERG BUSINESSWEEK; SET DESIGN: ADI GOODRICH

THRONE TO THE HEIR

How Nursery Works markets its greatest hits, most of which are built by L.A. furniture makers

Real 24-karat gold "boldly contrasts the richness of the American-sourced solid black walnut" on the **Lydian crib** ($6,900), which converts to a toddler bed when baby grows older.

The company's **Tree bookcase** ($899) is more than 5 feet tall and holds 100 books. The "complex piece is sanded and assembled by hand to ensure you receive a perfect, smooth form."

The tufted, wingback **Empire rocker** ($799-$999) is offered in almost a dozen fabrics, with legs that are made from solid ash for a "smooth gliding motion."

"The first 100 percent recyclable, nontoxic acrylic crib," the **Vetro** ($4,500) is the company's signature piece. Not into clear? Also available in "shadow" (black).

"I WAS LOOKING AT INNOVATIVE FURNITURE FOR THE HOME, AND IT STOPPED AT THE CHILDREN'S ROOM"

Daniel and Teddy Fong

The latest batch of Nursery Works cribs caters to wealthy parents with its U.S. manufacturing, mostly from L.A. woodshops. Instead of selling the cribs online, Nursery Works relies on less traditional channels, including interior designers, modern furniture stores, and even art galleries. "We were interested in filling the gap in nursery for people who purchase a Poliform couch or a really special art piece," Wong says. (Before she started working on the cribs, she was an assistant to Steve Jobs.)

In June the company will release a model called the Gradient, a $7,500 oval-shaped bed framed by undulating slats of solid maple that Bel Bambini's Neshat predicts will become a best-seller among stars, then trickle down to her clients. The family is also releasing the Lydian, a $6,900 black-walnut model with a 24-karat gold frame adorning the front. For customers who are feeling frugal, there's Highlight, a $3,900 option that can transform into a grownup's desk once baby graduates. To design the cribs, the executive team works with Eric Lin, who is Tracy's husband and a trained architect, and Matthew Grayson, a product designer from the Art Center College of Design. "We have all the manufacturing capabilities and financial backing to change the industry," Teddy says.

Neither Tracy nor Teddy planned to join the family business. After graduating from college in 2004, Tracy took the summer off to hang out with friends before starting a job as an art curator. But her father's office was short-staffed, so he asked her to pick up the slack. After a month of making Starbucks runs for the six other employees, she started cold-calling some of MDB's customers. The product reviews were good, she discovered, but the company had zero brand recognition. A salesperson by nature, she persuaded companies such as Target and Babies "R" Us to stock the cribs online and then market them through their Web and e-mail channels. "People were like, 'You're crazy—no one's going to buy furniture on the Internet,'" Tracy says. "And I'm thinking, I just sold a million dollars online." At 34, she's now the vice president for sales. Teddy came onboard in 2006, setting aside a career in finance, after he also realized his dad's company had growth potential. "I was looking at innovative furniture for the home, and it stopped at the children's room—nothing was happening there," says Teddy, 32, who shares the title of chief executive officer with his father.

It's relatively easy to make a splash in a niche dominated by traditional furniture in white and dark brown. Along with Nursery Works, MDB has also been influential in introducing cribs in colors like canary yellow and robin's-egg blue. The company's recent, more substantive changes have been harder to pull off in an industry governed by stringent child-safety rules. "You have to innovate within a box," Teddy says, "because the testing is so rigorous." MDB gets every style certified by the Juvenile Products Manufacturers Association and tested at third-party labs approved by the Consumer Product Safety Commission at a cost of about $2,000 per round. Nursery Works had to remake the Gradient at least five times because its assembly stymied some testers.

The team has plans for other complicated cribs, including one with a base that doubles as a play tunnel and another with a foldout teepee. They will introduce increasingly outlandish concepts carefully and slowly, when they deem consumers are receptive. For those who can't afford a crib, Nursery Works will also introduce a line of organic-cotton bedding ($38-$145) and folded-paper animal busts ($45) in June. Josh Johnston, MDB's specialty sales manager and one of Teddy's closest friends from Harvard, thinks of this the way a luxury fashion brand might. "Very few people have the monetary means to purchase a Chanel dress, at least responsibly," he says. "But you can go out and buy Chanel perfume." Maybe not for your baby, though. Ⓑ

THIS PAGE: PHOTOGRAPH BY BORU O'BRIEN O'CONNELL FOR BLOOMBERG BUSINESSWEEK

After a week of sales, the company had to make a second run. *$79 each, or $225 for the trio; jacques-elliott.com*

MAKING TIES COOL AGAIN

A rock star's argument for knotting up this summer. By Jason Chen

Famous guitarists aren't usually known for their tie predilections, but Albert Hammond Jr.—from the Strokes and releasing a solo album in July—has always been a fan of the suited-up look. After wearing some silk from the young New York brand Jacques Elliott, Hammond, 35, reached out to designer Elliot Aronow about collaborating on some summer neckwear.

Ties have had a rough go of it lately. The market's dropped to $850 million—about half the size of its mid-'90s heyday, say analysts at NPD Group—as suited men opt instead for plain oxford shirts or T-shirts with blazers. So Hammond decided to update the staid accessory with slightly shiny textures, a herringbone pattern you only notice up close, and in one instance, a tiny red lightning bolt modeled on the design of his guitar strap.

"I wanted to create ties that didn't have to be for the office but could work there," Hammond says. "Or on someone in a punk band." Aronow worked with his Brooklyn factory to get the shape right: At 56 inches, the ties are slightly shorter than standard. And they're 3 inches at their widest point, half an inch thicker than the skinny ones popularized by J.Crew and others in recent years. It will soon be sweltering out, so AHJ ties are made from lightweight wool-cotton blends that Aronow suggests pairing with a seersucker, linen, or cotton jacket. Hammond is less of a stickler. "I'll wear a tie even if it's hot," he says, "but I'll just put it on with a short-sleeve button-up." Note: Some stage presence required. B

PHOTOGRAPH BY PATRICIA LOPEZ FOR BLOOMBERG BUSINESSWEEK

WEALTHY WOMEN ON DISPLAY

Wednesday Martin embeds with the country's richest, meanest ladies who lunch. By Sheelah Kolhatkar

One day, shortly after moving to Manhattan's Upper East Side, Wednesday Martin was walking home with a carton of milk when an elegantly dressed older woman came barreling toward her on the empty sidewalk. Martin inched closer to the curb to get out of her way, but the woman kept bearing down until Martin found herself pressed against a trash can. Then the woman smacked right into Martin with her gigantic designer handbag, smirking as she passed. "I had been charged," Martin says, as if the woman was a rhinoceros. "At least that's how it felt to the anthropologist in me."

Martin shares this incident in *Primates of Park Avenue*, a breezy book about her life after relocating with her family to one of the most expensive ZIP codes in the country. Right away, the neighborhood revealed itself as a toxic jungle. Martin was immersed in an ultracompetitive, opulent mommy culture, a scene so repellent, it's hard to imagine why anyone would choose to live there.

At first you want to root for Martin, a Midwesterner who studied anthropology in college and applies the language of Margaret Mead to the women around her with entertaining effect. The trouble is that everything she describes is so over-the-top, it comes off more as satire than memoir. The way Martin portrays them, these women—who are largely well-educated and married to Wall Street moguls—have no redeeming qualities.

"Aside from a shrinking water hole in the Serengeti during the dry season," she says, "there is no place more desperate, aggressive, dangerous, and inhospitable than the halls of an exclusive Manhattan private school." The women click-clacking through each morning are "*Mean Girl* Moms," micromanaging their privileged children and elbowing each other out of the way. Martin says she cried regularly because they were so nasty. Now she returns the favor: She describes their almost entirely dead-animal-based fashions—Céline, Chanel, or Hermès bags, Jimmy Choo boots, leather dresses, and chinchilla coats—in lavish detail, along with their obsessive focus on perfect homes and bodies. The women jockey for "yearend bonuses" from their husbands so they can buy more furs or tables at charity dinners. But like everything else in the book, the detail is thrown off so casually and anonymously that it's hard to assess how real it is.

ILLUSTRATION BY JUSTIN METZ; WOMEN: PHOTOGRAPHS BY JIMMY TAGLIAFERRI FOR BLOOMBERG BUSINESSWEEK

Martin also never explains how she ended up "moving on up" herself, making only vague references to her husband, who finances their lifestyle. (A quick Google search reveals that he's head of a "Cayman Island-based investment fund," typically code for a hedge fund.) She bemoans the abundance all around her—"everything was so honeyed and moneyed and immaculate that it made me dizzy"—but quickly loses perspective. She claims she was so disorganized that she missed nursery-school deadlines, yet her son magically gets into the best one in the city. "I have no idea why my son was admitted," Martin says, though she acknowledges her husband's sister might have made a call. It soon becomes clear that Martin isn't the outsider she claims to be; she's become one of these women herself.

Still, she's tapped into something provocative and she knows it. Even though few people live like this, there's an appetite for stories about rich women behaving badly, driven by some combination of voyeurism, misogyny, and class rage. It fuels shows like *The Real Housewives* and *Gossip Girl*, and goes all the way back to Edith Wharton and Marie Antoinette. Martin has studied the genre well: Just when the moms become overly unlikable, she assures us they have problems, too. For one, they worry about being dumped by billionaire husbands, on whom they're entirely dependent. "Access to your husband's money might feel good," Martin writes, channeling Gloria Steinem. But "such access can't buy you the power you get by being the one who earns it." To cope, the women pop antidepressants and glug down white wine. These women swinging their Birkin bags are miserable and should be pitied.

By the end, all you can think is, Move, for God's sake. Anyone who chooses to be here deserves what she gets. Apparently Martin came to the same conclusion—to be closer to the kids' new private school, her family relocated to another, almost as wealthy, part of town. B

Don't Get Burned

Stylish UV-blocking clothing, the best new shades, and easy-apply sunscreens to keep you from being a toasted, sweaty, office mess
By Maura Kutner Walters

Channel your inner Gilligan

There's a reason the dad hat is having a resurgence: Buckets best protect your head from ultraviolet rays. When made from cotton, they also have a cooling effect. This one's from Stag, a sustainable menswear store with locations in Dallas, Houston, and other sweltering cities. *$80; stagprovisions.com*

Save your sunglasses

Most pairs are made with breakable plastic lenses. Otis Eyewear relies on mineral glass that's scratch-resistant and 100 percent UV-protective. *$170; otiseyewear.com*

Don't forget lip balm

This Anthony Logistics cream offers SPF 25, along with a matte finish (so your mouth won't look glossy) and mint flavor to freshen breath. *$8; anthony.com*

Choose the best tee

The soft, stylish activewear made by Outdoor Voices is designed for light recreation, not intense sports. Try a heather-gray shirt under your favorite blazer: Its sweat-absorbing material draws moisture off the skin and helps it evaporate quickly, so you'll look relaxed as you escape early on a summer Friday. *$65; outdoorvoices.com*

Stick it on

Sun Bum's SPF 30 stick won't get in your eyes or make hands slippery on the morning commute. It glides on easily, has a light texture, and remains water-resistant for up to 80 minutes. *$15; trustthebum.com*

PHOTOGRAPH BY STEVEN BRAHMS FOR BLOOMBERG BUSINESSWEEK; SET DESIGN: DAVE BRYANT; STYLIST: TATUM PIA; HAIR AND MAKEUP: REBECCA GARCIA

Upgrade those shades

The unisex ones from Smoke x Mirrors are handcrafted in France using two separate pieces of acetate—in colors like yellow crystal and matte gold—then melded without metal or glue to create multidimensional hues. So they glimmer in the sun while lending total UV protection. *$295; smokexmirrors.com*

Pucker prettier

Functioning as both a balm and a lipstick, Fresh's sugar rosé tinted treatment provides SPF 15 protection and a subtle, slightly shiny, kiss of pink. *$22.50; fresh.com*

Get a hot watch

The casual Burnham watch by Oak & Oscar has a slick matte-gray dial, a sapphire-crystal face, and a Horween leather strap that will take on character as you wear it—especially if you're often outside. Swim in it, too: It's water-resistant up to 100 meters. *$1,450; oakandoscar.com*

Wear a stronger shirt

Donning a white tee is basically like going topless. That thin layer of cotton is equivalent to wearing SPF 5. Instead, opt for Mott 50's lightweight striped tee, which is made of a dense, tight weave to yield maximum UV protection. *$68; mott50.com*

Scarf up in summer

Headscarves keep hair in place on a windy day, but they don't do much to protect your scalp (or fresh highlights) from solar glare. Ida Bella SPF 50 cotton scarves are woven with Tencel Sun, a durable fiber, then get laundered 40 times and undergo ultraviolet testing in a laboratory to ensure the fabric is fully protective. *$25; spfaddict.com*

Make sunscreen your makeup

Suntegrity's five-in-one natural moisturizing face lotion is tinted to even out tones while protecting via SPF 30 with zinc oxide. Try it under your foundation as a primer. *$45; dermstore.com*

Monitor your exposure

After you select your skin tone on an iPhone app, built-in sensors in the June bracelet measure rays to calculate UV intake. Push notifications to your phone tell you when to reapply sunscreen, which level of SPF to use, and whether you need sunglasses or a hat. *$129; junebynetatmo.com*

NO WAY TO SAY GOODBYE

You're ending your e-mails wrong. By Rebecca Greenfield

It's time to stop using "best." The most succinct of e-mail signoffs, it seems harmless enough, appropriate for anyone with whom you might communicate. Best is safe, inoffensive. It's also become completely and unnecessarily ubiquitous. That development is relatively recent: A University of Pennsylvania study from 2003 found that, out of hundreds of e-mailers, only 5 percent opted to close with best. It came in behind "thank you" and "regards." But a quick search through your work account will quickly clear up two things: 1) No one says regards anymore; 2) everyone says best.

When e-mail first entered the office in the 1990s, most users wanted to abandon the formalities of letter writing altogether, so they omitted signoffs. "There was no salutation and no closing," says Barbara Pachter, a business etiquette coach. "It was like a memo." In a *Los Angeles Times* article from that era, Neil Smelser, a sociologist from the University of California at Berkeley, predicted that the rise of electronic communication would ultimately kill off the written goodbye altogether.

But as e-mails started to function (and look) more like letters, people reverted to formal, familiar behavior. Now, "there is a whole hierarchy of closings," Pachter says. So how do you choose? "Yours" sounds too Hallmark. "Warmest regards" is too effusive. "Thanks" is fine, but it's often used when there's no gratitude necessary. "Sincerely" is just fake—how sincere do you really feel about sending along those attached files? "Cheers" is elitist. Unless you're from the U.K., the chipper closing suggests you would've sided with the Loyalists.

> **"WARMEST REGARDS" IS TOO EFFUSIVE; "SINCERELY" IS JUST FAKE**

The problem with best is that it doesn't signal anything at all. "Best is benign," says Judith Kallos, an e-mail etiquette consultant. "It works when you apparently don't know what else to use." Others have called it charmless, pallid, impersonal, or abrupt. Caity Weaver, writing for the Hairpin, said it's like "the black tank-top tucked in the rear of the display" at Target. "A few years ago, best seemed kind of uncaring—like turning your shoulder to the person without thinking," says Liz Danzico, the creative director at NPR, who occasionally blogs about e-mail communication. "Now, it's like a virus." And so it's mutated: "All my best," "all best," "very best," and so on.

"Best wishes" goes back centuries, but the standalone best first appeared in 1922. The earliest version of it in an American letter, per the Oxford English Dictionary, came from F. Scott Fitzgerald: "Zelda sends best," he said in a note to the literary critic Edmund Wilson. It crept further down the page throughout the 20th century; the first-known usage as a closing was in a 1968 missive to the writer Larry L. King that ended, "Best, Bill." Even then it read cold: King criticized the idea, calling it "real buddy-buddy."

Our tastes in valedictions have been trending bland for centuries, away from the elaborate farewells that first appeared in the Bible. "Ever since the 18th century, the English speaking have been busy pruning away all ornament of expression," wrote Emily Post, the foremother of etiquette, in 1922. "Leaving us nothing but an abrupt 'Yours truly.'" The trend has extended into digital communication. Fearful of coming off as too smug or affectionate, we've been bullied into using empty words. I made an (unscientific) online survey, and among my friends and colleagues, 75 percent use best or thanks, though many admitted that neither was ideal. "I hate best, but it's what I go with," one respondent lamented.

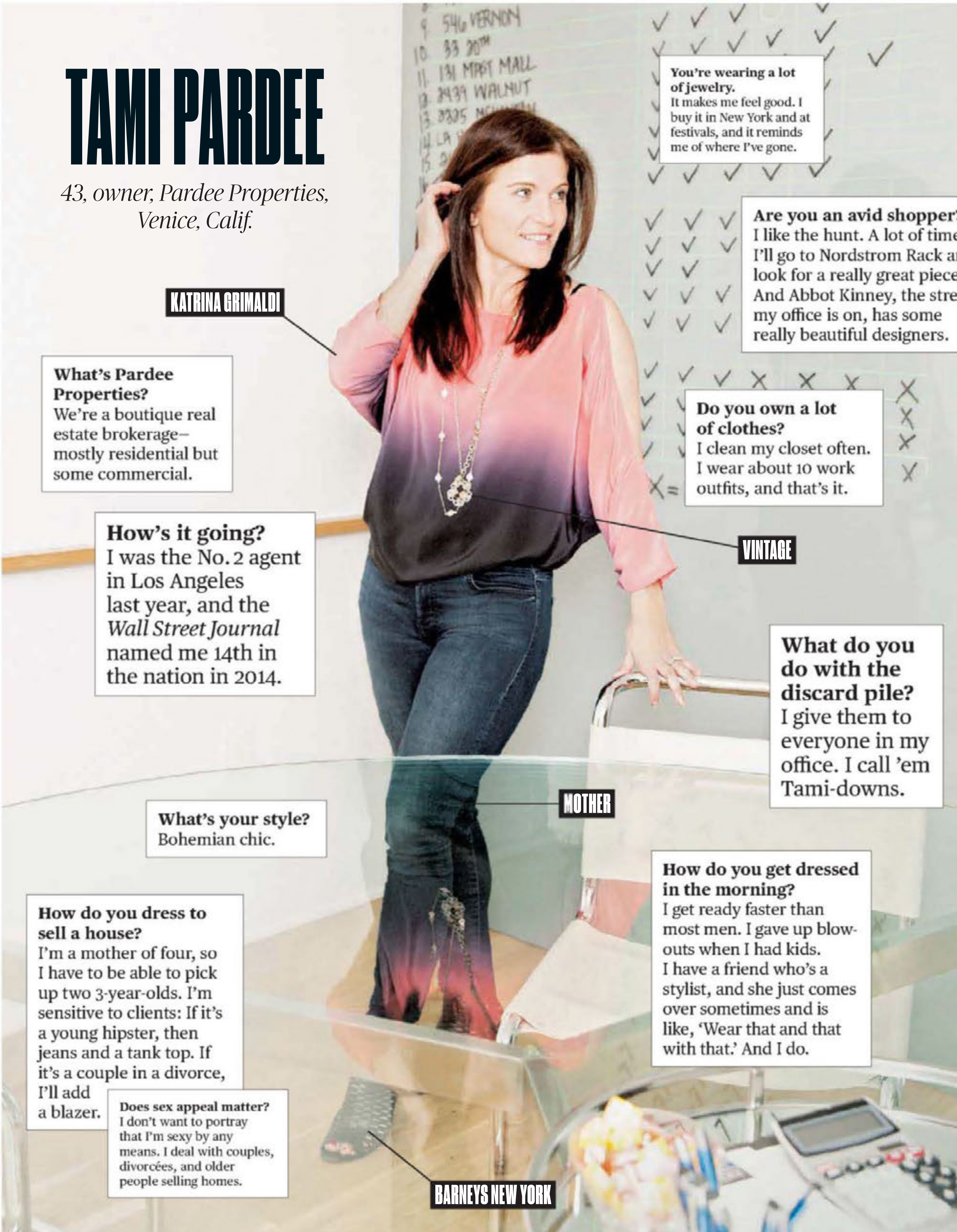
So if not best, then what?

Nothing. Don't sign off at all. With the rise of Slack and other office chatting software, e-mail has begun functioning more like instant messaging anyway. "Texting has made e-mail even more informal than it is," Pachter says. In conversations with people we know, complimentary closings have started to disappear. Tacking a best onto the end of an e-mail can read as archaic, like a mom-style voice mail. Signoffs interrupt the flow of a conversation, anyway, and that's what e-mail is. "When you put the closing, it feels disingenuous or self-conscious each time," Danzico argues. "It's not reflective of the normal way we have conversation." She ends all her e-mails, including professional ones, with the period on the last sentence—no signoff, no name, just a blank white screen. B

ILLUSTRATION BY OTHER MEANS

TAMI PARDEE

43, owner, Pardee Properties, Venice, Calif.



KATRINA GRIMALDI

VINTAGE

MOTHER

BARNEYS NEW YORK

You're wearing a lot of jewelry.
It makes me feel good. I buy it in New York and at festivals, and it reminds me of where I've gone.

Are you an avid shopper?
I like the hunt. A lot of times I'll go to Nordstrom Rack and look for a really great piece. And Abbot Kinney, the street my office is on, has some really beautiful designers.

What's Pardee Properties?
We're a boutique real estate brokerage—mostly residential but some commercial.

Do you own a lot of clothes?
I clean my closet often. I wear about 10 work outfits, and that's it.

How's it going?
I was the No. 2 agent in Los Angeles last year, and the *Wall Street Journal* named me 14th in the nation in 2014.

What do you do with the discard pile?
I give them to everyone in my office. I call 'em Tami-downs.

What's your style?
Bohemian chic.

How do you get dressed in the morning?
I get ready faster than most men. I gave up blow-outs when I had kids. I have a friend who's a stylist, and she just comes over sometimes and is like, 'Wear that and that with that.' And I do.

How do you dress to sell a house?
I'm a mother of four, so I have to be able to pick up two 3-year-olds. I'm sensitive to clients: If it's a young hipster, then jeans and a tank top. If it's a couple in a divorce, I'll add a blazer.

Does sex appeal matter?
I don't want to portray that I'm sexy by any means. I deal with couples, divorcées, and older people selling homes.

PHOTOGRAPH BY BORU O'BRIEN O'CONNELL FOR BLOOMBERG BUSINESSWEEK

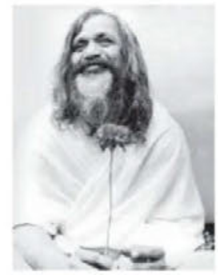
Interview by Arianne Cohen

How Did I Get Here?

RICK GOINGS

Chairman and chief executive officer, Tupperware Brands

Maharishi Mahesh Yogi, founder of Transcendental Meditation



Education

Wheaton Community High School, Wheaton, Ill., class of 1963

"The two people who make it famous are Bob Woodward, who's a friend, and John Belushi, who was a student council member and a serious football player."

Guilford College, Greensboro, N.C., class of 1970

"I did a history major and a religious studies minor—I've done Transcendental Meditation since I was 25."

Work Experience

1964–66
Petty officer on the *USS Power*, U.S. Navy

"Active duty. We did refresher training every spring in Guantanamo Bay, and we'd go out every morning and chase Russian submarines."

1967–70
Reserve petty officer, U.S. Navy

1970–85
CEO, president, Dynamics

"We sold smoke and heat detectors, two for $200, and opened 300 franchises. It worked for about 15 years, until you could buy a $12 device at Sears."

1986–88
President, Avon Germany, group vice president, Avon Products

Speaking at Tupperware's global headquarters in 1994

"My grandmother was Jewish, and I woke up one day to find I was running a $100 million German business."

1988–89
Senior operating officer, Pacific Rim, Avon Products

1989–92
President, Avon USA, Avon Products

"I got called to be No. 2. It was thought I was going to be the next chairman, but I said to the CEO, 'Jim, we sure seem to have a lot of disagreements. Would you rather I not be here?' He said yes. I got a generous severance."

Joined the board of Boys & Girls Clubs of America in 1989 and has served as chairman twice

With Colin Powell at a Boys & Girls Clubs of America event in 2008

1992–96
President, Tupperware Worldwide, Premark International

"I had lots of offers. I'd had a fairly rapid rise, spoke French and German, and had worked in Europe and Asia."

1996–97
President, Tupperware Brands

Tupperware was spun off from Premark in 1996

1997–Present
Chairman and CEO, Tupperware Brands

In the Tupperware headquarters gallery in Orlando—the only store in the U.S. where its products can be purchased

"Eighty-five percent of our product was in food storage, and the challenge was to differentiate: We're now the No. 1 seller of cookbooks in France. One-third of our China business is in water filtration."

There's a Tupperware party every 1.3 seconds

Life Lessons

1. "Your whole life should be a quest to be the best version of yourself." **2.** "Skills and savvy get you to the top, but character's what keeps you there." **3.** "Gender parity isn't checking a box. It's good for business."

Courtesy subject (4), Alamy (3)

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